AIR QUALITY GROUP
CROCKER NUCLEAR LABORATORY
UNIVERSITY OF CALIFORNIA, DAVIS

FINAL REPORT TO THE
CALIFORNIA AIR RESOURCES BOARD
ON
CONTRACT NO. A9-147-31

THE EFFECT OF MONO LAKE ON THE AIR QUALITY IN THE MONO LAKE REGION

BRUCE H. KUSKO, JOHN B. BARONE,
and THOMAS A. CAHILL

SEPTEMBER, 1981

TABLE OF CONTENTS

REPORT: The Effect of Owens Dry Lake on Air Quality in the Owens Valley with Implications for the Mono Lake Area. J.B.Barone, L.L. Ashbaugh, B.H. Kusko, and T.A. Cahill: ACS SYMPOSIUM SERIES. No. 167, ATMOSPHERIC AEROSOL: SOURCE/AIR QUALITY RELATIONSHIPS, 1981

LIST OF FIGURES

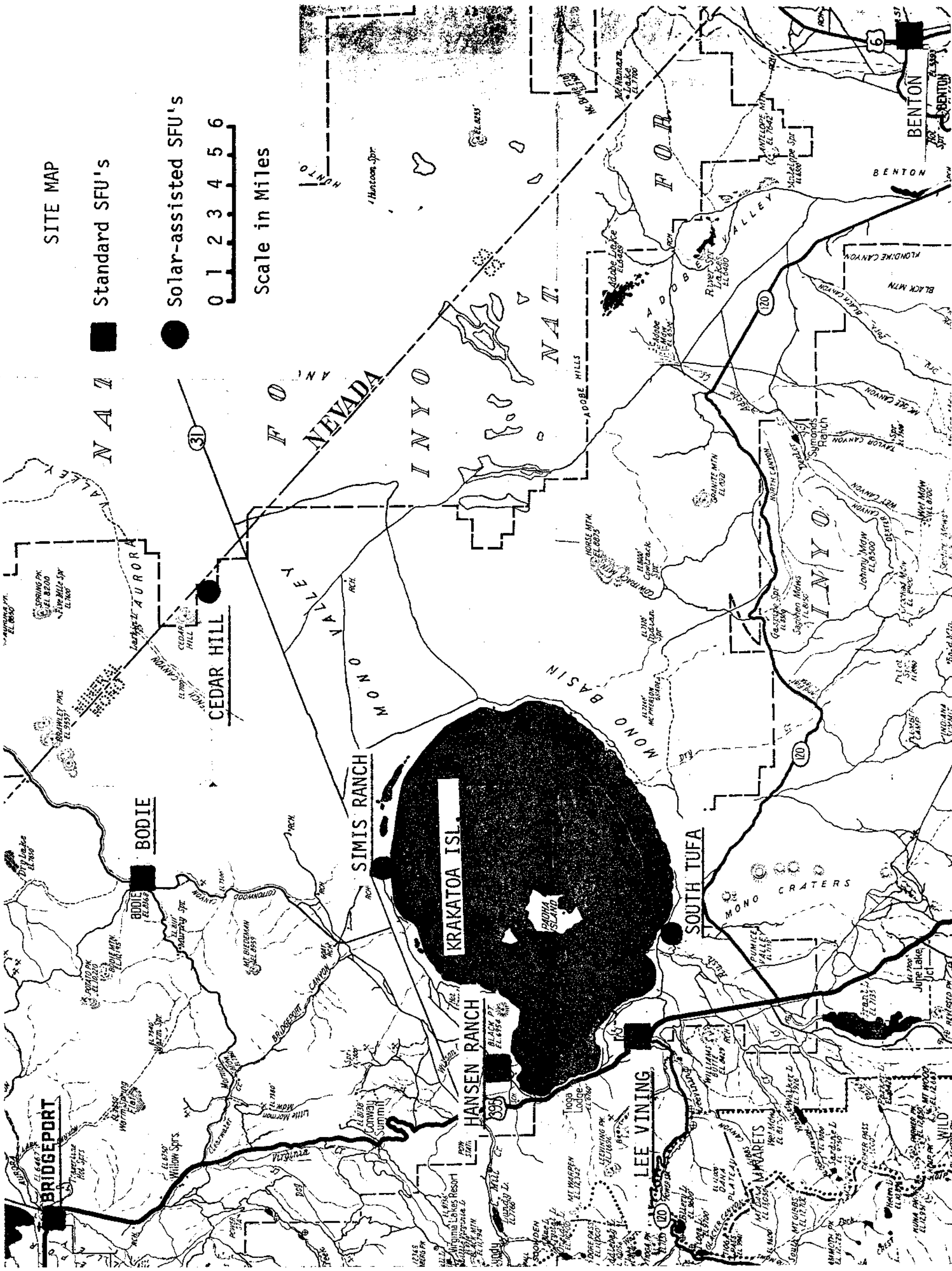
LIST OF TABLES

EXECUTIVE SUMMARY

This report summarizes a study of atmospheric particulate matter in the vicinity of Mono Lake, California. Mono Lake is located east of Tioga Pass and Yosemite National Park, and is the largest natural lake entirely within the state. The lake has no outlet, and over the centuries it has both shrunk in size and become strongly alkaline. Diversion of four of the five feeder streams of Mono Lake has provided considerable high quality water and hydroelectric power to the Los Angeles Department of Water and Power, but at the cost of accelerating the lowering of the lake level. Exposure of the lake bottom has formed alkaline playas of considerable extent. Residents have been concerned about dust episodes, confirmed recently by A.P.C.D. Total suspended particulate monitoring results show infrequent but extremely elevated dust levels, (to 1800$\mu g/m^3$ near Mono Lake). The present study was designed to determine the frequency and severity of dust episodes, acertain the size and chemical nature of suspended particulates, associate the dusts with local and regional sources, and document the geographical extent of such events. These goals parallel those of a similar A.R.B.-funded study by the Davis Air Quality Group of the dry Owens Lake, and this study benefftted from methodology and results of the earlier study.

The study includes data taken at Hansen's ranch (see Figure E-1) between April 24 and June 18, 1979, in the earlier Owens Lake study. Particulate monitoring took place near Mono Lake between May 13 and October 28, 1980, at sites in Bridgeport, Bodie, Hansen's ranch, Lee Vining, and Benton, Ca., using seven day averaging periods. Daily 24 hour sampling was conducted at Hansen's ranch from May 13 to July 16, and from July 16 to October 18 in the city of Lee Vining. Air quality was also studied with solar-assisted battery powered air samplers, between July 15 and November 30. All air samplers used in this study were stacked filter units (SFU's), delivering two size fractions between 15μm to 2.5μm, and less than 2.5μm diameter. Retention of dry, coarse particles was enhanced by using grease coatings on the first stage, which also greatly reduced mis-sizing based on bounce phenomena. The separation at 2.5μm is done by partial filtration, giving a gentle cut similar to the human lung but much softer than impactors.

FIGURE E-1



SITE MAP
Standard SFU's
Solar-assisted SFU's
0 1 2 3 4 5 6
Scale in Miles
BRIDGEPORT
BODIE
CEDAR HILL
SIMIS RANCH
KRAKATOA ISL.
HANSEN RANCH
LEE VINING
SOUTH TUFA
BENTON
NEVADA
MONO VALLEY
MONO BASIN
MONO CRATERS
ADOBE VALLEY
AURORA

Samples were also collected of local soils and playa sediments. These samples were suspended in an air stream, and size-selected for particles below 15μm to coincide with the aerosol techniques.

Analysis was done for total mass (all particles less than 15 microns) and for elemental content, (sodium through lead), using particle induced x-ray emission (PIXE) at Davis. These analytical systems are subject to strict third party quality assurance protocols, partly because they were the major analytical methods used for the 40 station EPA/National Park Services Western Fine Particle Network. Sensitivity is nominally 10μg/cm^2, while absolute accuracy has been consistently better than 5%. Some samples were examined by a scanning electron microscope with elemental analysis by electron beam induced x-rays.

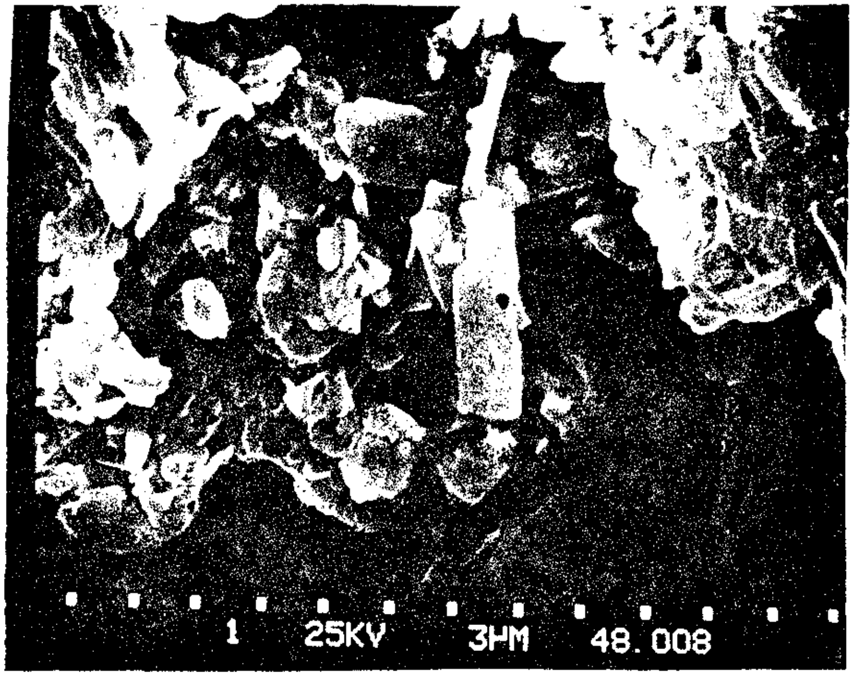
The results of the study at Mono Lake are similar to those obtained near Owens Lake, but the levels of dust in episodes are neither as severe nor as frequent. Analysis of soils near each lake give rather similar elemental values, while composition of the alkaline crusts are also similar. In particular, the Cl/S levels at each site were identical (3.3 $\pm$ 0.1, Owens Lake; 3.3 $\pm$ 0.5 at Mono Lake but ignoring Pahoa Island). However, Mono alkaline crusts have higher levels of sodium, sulfur and chlorine relative to soil-like materials. No analog to Mono's calcium carbonate tufa columns was sampled at Owens Lake. The SEM analyses of crystalline materials (K. Lajoi, USGS) showed sulfur as the dominant peak, with little chlorine. This result may help explain the relatively elevated sulfur levels seen at both Owens Lake (Keeler) and Mono Lake (Cedar Hill, Simis) sites, as the crystalline material may resuspend more easily (Figure E-2).

Air quality at Owens and Mono Lakes was simultaneously sampled in spring, 1979. Figure E-3 shows these results. Two periods characterized by elevated dust episodes were present at both sites, while mean dust values climbed to equivalent levels by late June. The Owens episodes could be clearly associated with alkaline lake bed materials and not wind blown soils, through upwind-downwind sampling and by chemical similarities to the lake playas. These results enhance the similarities between the Owens Lake and Mono Lake airsheds.

Monitoring at Mono Lake in 1980 was carried out in mean and peak wind conditions lower than those of 1979 (Figure E-4). This is one possible cause for the lower particulate levels in 1980 at Mono Lake, (Figure E-3), but the elevated

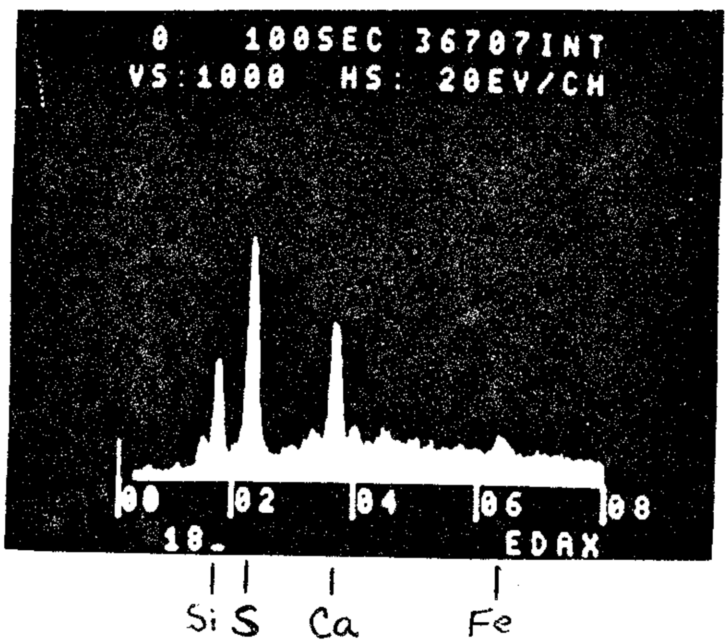
FIGURE E-2

3



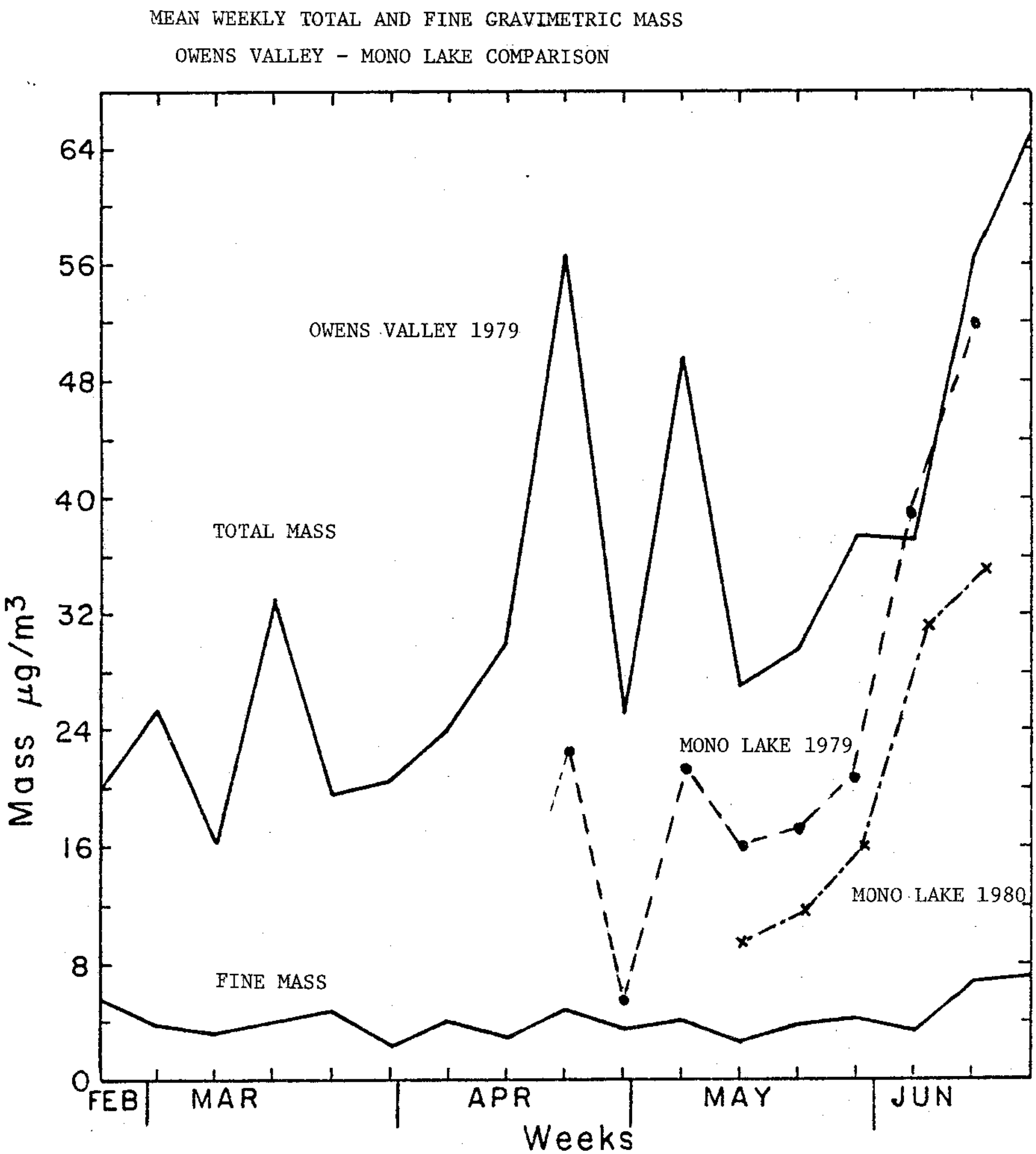
1 25KV 3µM 48.008

3



0 100SEC 36707INT
VS:1000 HS: 20EV/CH
00
02
04
06
08
18.
EDAX
Si
S
Ca
Fe

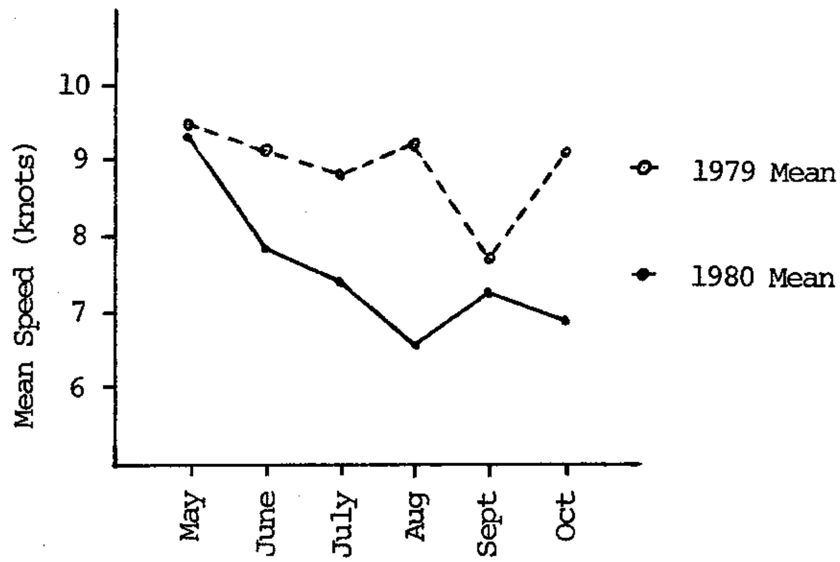
FIGURE E-3

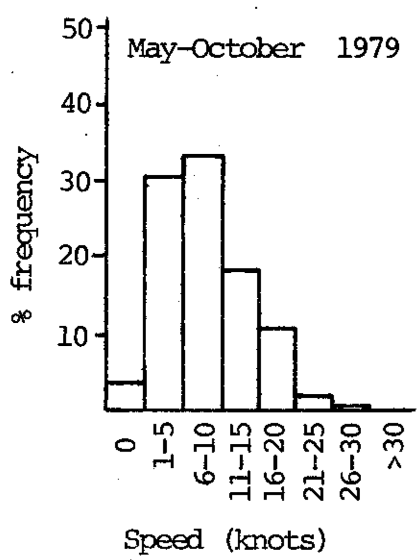


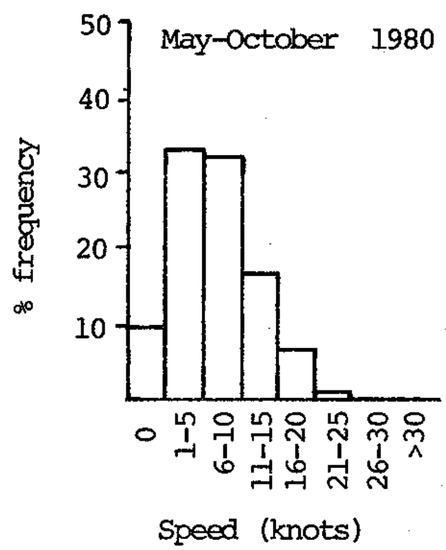
MEAN WEEKLY TOTAL AND FINE GRAVIMETRIC MASS
OWENS VALLEY - MONO LAKE COMPARISON
OWENS VALLEY 1979
TOTAL MASS
MONO LAKE 1979
MONO LAKE 1980
FINE MASS
Mass μg/m3
0
8
16
24
32
40
48
56
64
FEB
MAR
APR
MAY
JUN
Weeks

FIGURE E-4

Bishop Wind Speed Data - 1979 vs 1980







precipitation in early 1980 could also be implicated. Even though the total dust levels were reduced in 1980 at Mono Lake, the fraction associated with lake playas increased relative to soils, as shown by S/Fe and Cl/Fe ratios. This is in accord with decreased aeolian soil transport associated with high soil moisture content.

Monitoring studies at sites near Mono Lake (Lee Vining, Hansens's ranch) and several miles from the lake (Bridgeport Bodie and Benton) yielded information on frequency and occurance of events, size and chemical signatures of dust episodes, and transport away from the lake. Mean particulate levels were good, averaging about 35μg/m in the less than 15μm inhaleable size fraction. Fine particulate matter was a small fraction of the mass. Only sulfur particles were routinely present, but these showed no enhancement at the sites near the lake.

Sites near Mono Lake	Fine Sulfur	Period
Lee Vining	505 $\pm$ 268ng/m^3	5/13 - 10/28/80
Hansen's ranch	443 $\pm$ 308ng/m^3	5/13 - 10/28/80

Sites Away Mono Lake	Fine Sulfur	Period
Bridgeport-Bodie	501 $\pm$ 202ng/m^3	5/13 - 10/28/80
Benton	482 $\pm$ 257ng/m^3	5/13 - 10/28/80

Thus, as expected, fine particulate sulfur is not of local origin.

Little correlation was seen between sites near the lake and other sites in terms of the coarse soil particles that dominated the gravimetric mass. The combination of particulate size, chemical, and geographical information points to non-playa sources for most particulate mass at all four sites during the entire monitoring period.

The fraction of playa material present at sites near the lake is shown best in the daily monitoring data at Lee Vining. Here the characteristic short term episodes of alkaline minerals are best seen, clearly associated with local playa sources by their particle size and chemistry, as local soils are almost totally devoid of soluble alkaline salts. The levels, while increasing as fall approached, reached only 1600ng/m^3 (chlorine) and 800ng/m^3 (coarse sulfur) over this period. By associating these materials with total particulate mass from playa samples, one can estimate that only about 5 $\pm$ 3% of Lee Vining mass was from playa sources, May 13 to October 28, 1980. There were some days, however, expecially in the fall, when playa-associated materials dominated all other sources of total mass.

Detailed studies of periods characterized by blowing dust were carried out with solar-assisted battery powered SFU's. This technical innovation of the Davis Air Quality Group allowed measurements to be made for periods of up to 7 days at sites where electrical power is absent. The playa origins of such episodes was confirmed both visually and chemically. A lake wide episode, August 19 and 20, generated levels of 300μg/m^3,, while levels of up to 500μg/m^3 were observed up to the Nevada State line (Cedar Hill) on November 29-30. During the summer episodes Cl/S ratios were very similar to lake bed values, not showing the sulfur enhancement seen at Owens Lake, By late fall, however, Cl/S ratios had decreased by an order of magnitude for reasons presently unknown.

In summary, while the Mono Lake area is generally possessed of good to very good air quality, elevated dust episodes occurred in which the playas are clearly the dominant source. Particles are inhaleable (<15 microns), strongly alkaline, and occasionally achieve 24 hour levels that must be considered high on any health or welfare standard.

The present study was hindered by atypical wind and precipitation conditions in 1980, delay in setting up monitoring sites, and a duration too short to catch most of the spring and fall dust episodes. Lack of local meteorological information has made more difficult quantitative association of the complicated local winds to blowing dust.

INTRODUCTION

Mono Lake is one of several saline lakes that exist along the arid eastern escarpment of the Sierra Nevada. Located east of Tioga Pass near Yosemite National Park, Mono Lake is really an inland sea, for no rivers ever leave it. Several small streams have been depositing minerals in the Mono basin for thousands of years. The water has become so strongly alkaline that fish are unable to live in it. In recent years the level of the lake has been dropping, due to both natural evaporation and the diversion of its tributaries, causing more of the lake bed material to be uncovered. The possible suspension of this alkaline dust into the atmosphere has been the concern of residents of the basin and regulatory agencies.

In order to obtain quantitative data on air quality in the Mono Lake area, a study sponsored by the California Air Resources Board was conducted by the Air Quality Group at U.C. Davis. The study included both weekly monitoring and daily intensive sampling of particulate aerosols during a 24 week period, from May 13 to October 28, 1980. Measurement of ambient aerosol concentrations were made by size mass and elemental composition. Surface material was collected from the exposed lake bed and surrounding soils to help determine the source of these aerosols.

It should be noted that the air samplers used in this study collected only particles less than 15 micron aerodynamic diameter, ie. particles of respirable size. State standards for TSP are based on Hi-Volume samplers which have no inlet cutoff. Hence, particles as large as 100 microns can be captured by these instruments. Therefore, measurements made in this study may not indicate whether particulate standards have been violated, since a significant portion of the total suspended particulate mass is not measured by the stacked filter unit.

2. PARTICULATE SAMPLER DESCRIPTION

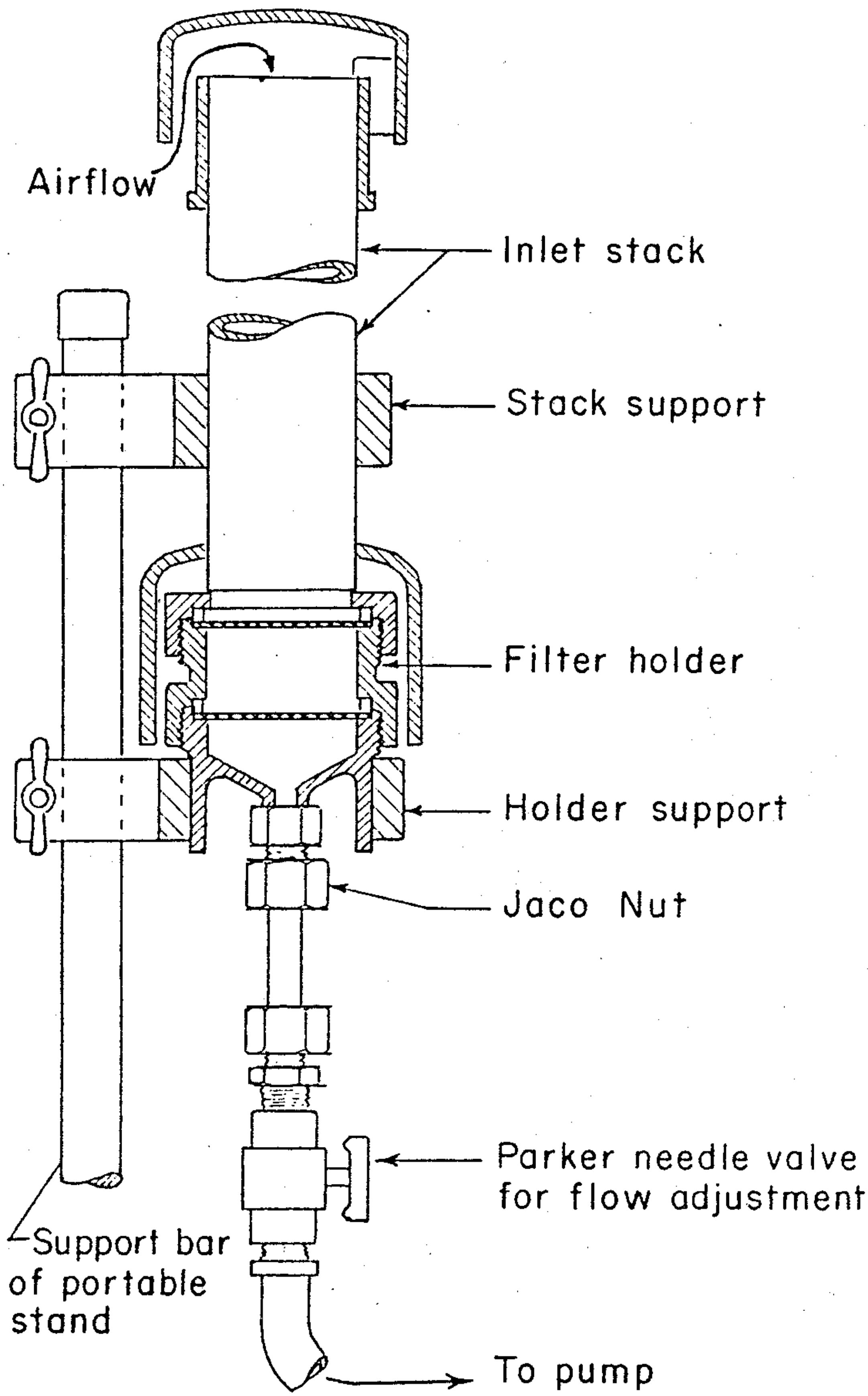
2.1 STACKED FILTER UNIT

The stacked filter unit (SFU) is a two-stage sampler in which size segregation is provided by the collection efficiency of 8μm pore size Nuclepore membrane. The first filter (coarse stage) collects particles between about 3μm and 15μm. The second filter (fine stage) collects the particles which pass through the first filter, that is, particles below about 3μm. The particle collection properties of the SFU are similar to those of the human respiratory tracts, as shown in Figure 1 . The figure includes the collection efficiency vs. particle size of two stages for a typical set of filters, along with the curve of the upper respiratory tract. Also shown for comparison, is the distribution of particles in a typical urban environment. The coarse stage of the SFU thus primarily collects particles from the coarse, or largely natural atmospheric mode which would be captured in the upper respiratory tract. The fine stage of the SFU primarily collects particles from the fine, or anthropogenic, mode which would be captured in the lungs and bronchial tubes.

Early tests on SFU's, both in the laboratory and infield intercomparisons, showed two problems; 1)some coarse, dry particles appeared on the fine stage due to a "bounce" or similar phenomenon, and 2)loss of dry particles from the coarse stage during transport. Both effects were largely (∿90%) eliminated by making the coarse stage sticky with an Apiezon-L grease applied at the factory under Air Quality Group supervision.

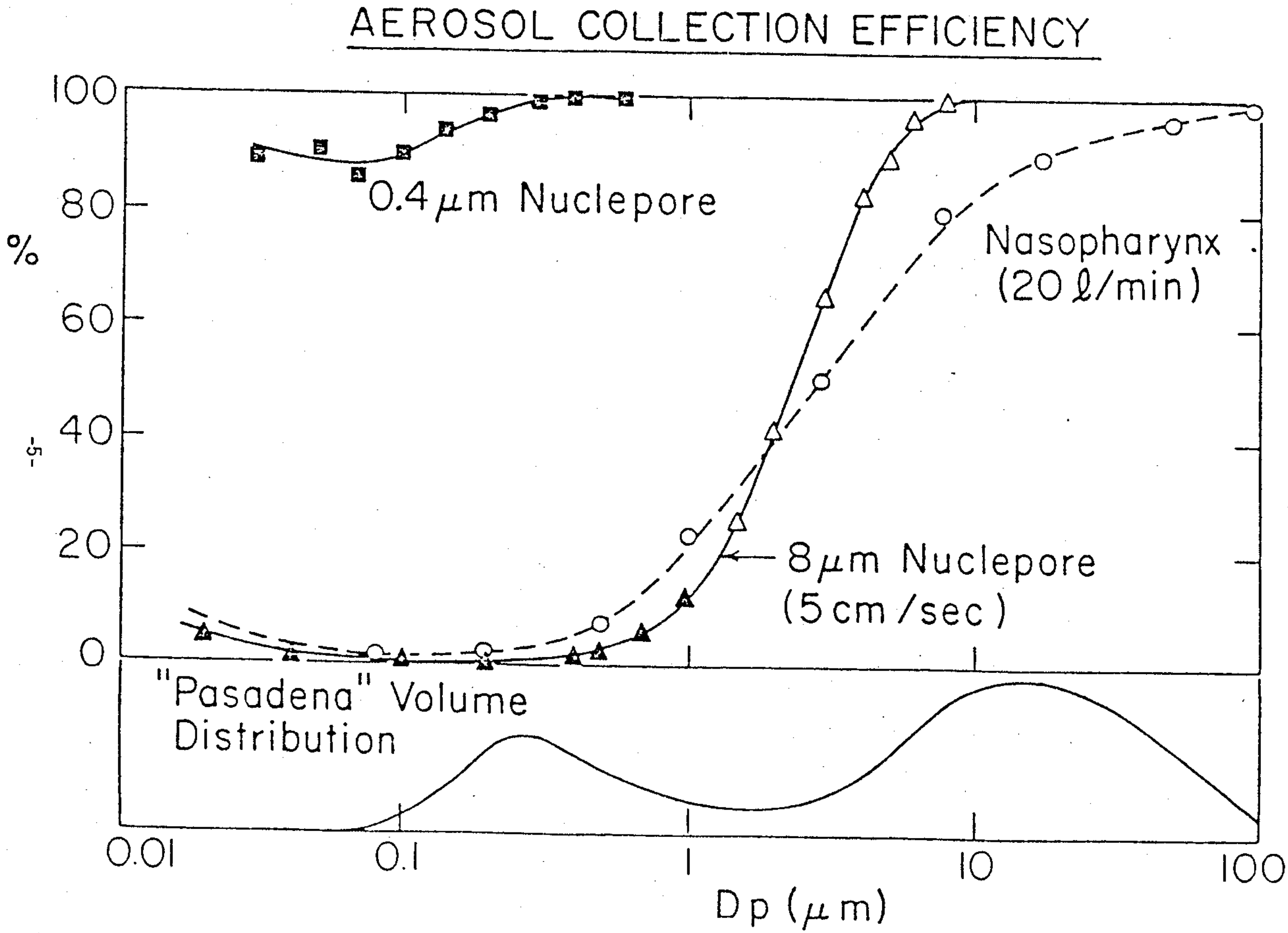
The SFU illustrated in Figure 2 is assembled from the following components:

Figure 1 Stacked Filter Unit



1. Intake	A stack and cap designed to permit ambient particles <15μm to be pulled through the filters. A wire screen is provided on the cap to prevent insects from entering the sampling system.
2. Filter Holder	A commercially available plastic multiple filter holder
3. Flow Adjustment	A brass needle valve is used to set the flow rate.
4. Pump	A diaphragm air pump is used to provide air flow through the filters. ITT Durair Model V-220 or Gast Model DOA-161-AA.
5. Flow Measuring Device	A calibrated orifice is placed upstream from the filters. The pressure drop across the orifice is measured by a magnehelic gauge, and is calibrated against flow through the filters via a spirometer.
6. Support Stand	A tripod is used to hold the filter holders and stack intake at a desired height - usually 5' (1.5m.) above ground.

FIGURE 2



AEROSOL COLLECTION EFFICIENCY
100
80
60
40
20
0
%
0.4 μm Nuclepore
Nasopharynx
(20 ℓ/min)
8 μm Nuclepore
(5 cm /sec)
"Pasadena" Volume
Distribution
0.01
0.1
1
10
100
Dp (μm)

2.2 MODIFIED MULTIDAY SAMPLER

The daily sampler used in this study is a hybridization of the ARB multiday sampler and the stacked filter unit, and is shown in Figure 3. The automatic switching mechanism of the multiday sampler was retained but the impactor drums and after-filter were replaced by 8 separate stack and filter assemblies. The use of stack filters results in less size segregation than the multiday (only 2 stages now rather than 3), but permits important gravimetric analysis of the filters. Each stack and filter assembly was used to collect areosols for 24 hours. The filters were changed weekly. All samples were collected at a flow rate of 10 liters per minute, and all sampler characteristics (inlet configuration, etc.) were identical to the stacked filter unit. Hence inlet cut and 50% cutpoint for the modified sampler were identical to the SFU.

2.3 SOLAR ASSISTED BATTERY POWERED UNIT

The solar assisted battery powered air sampling unit (BPU) is a dichotomous air sampler based on the stacked filter unit (SFU). It was designed to operate unassisted in areas lacking electrical power for one week at a time. The unit is shown in Figure 5. A rechargeable battery (6 volt, 20 amp hour gel cell) powers a Spectrex model AS-120 pump which pulls air through a stack and two filters at a rate of one liter per minute. The small size of the stack and area of the filters (25mm diameter) was chosen to maintain the 3 micron aerodynamic diameter for 50% capture efficiency at one liter per minute. A solar panel is used to recharge the battery during daylight hours. A regulating circuit ensures that relatively constant power is delivered to the pump which minimizes fluctuations in the flow rate. Direct roof top side by side comparisons of the BPU and SFU were conducted at U.C. Davis and the results are shown in Figure 6. Generally the BPU over-estimates the gravimetric mass, although the XRF elemental analysis shows fair agreement with the standard SFU. The unit is still being perfected and a detailed description is being prepared for publication. Thus, early results must be considered semiquantitative.

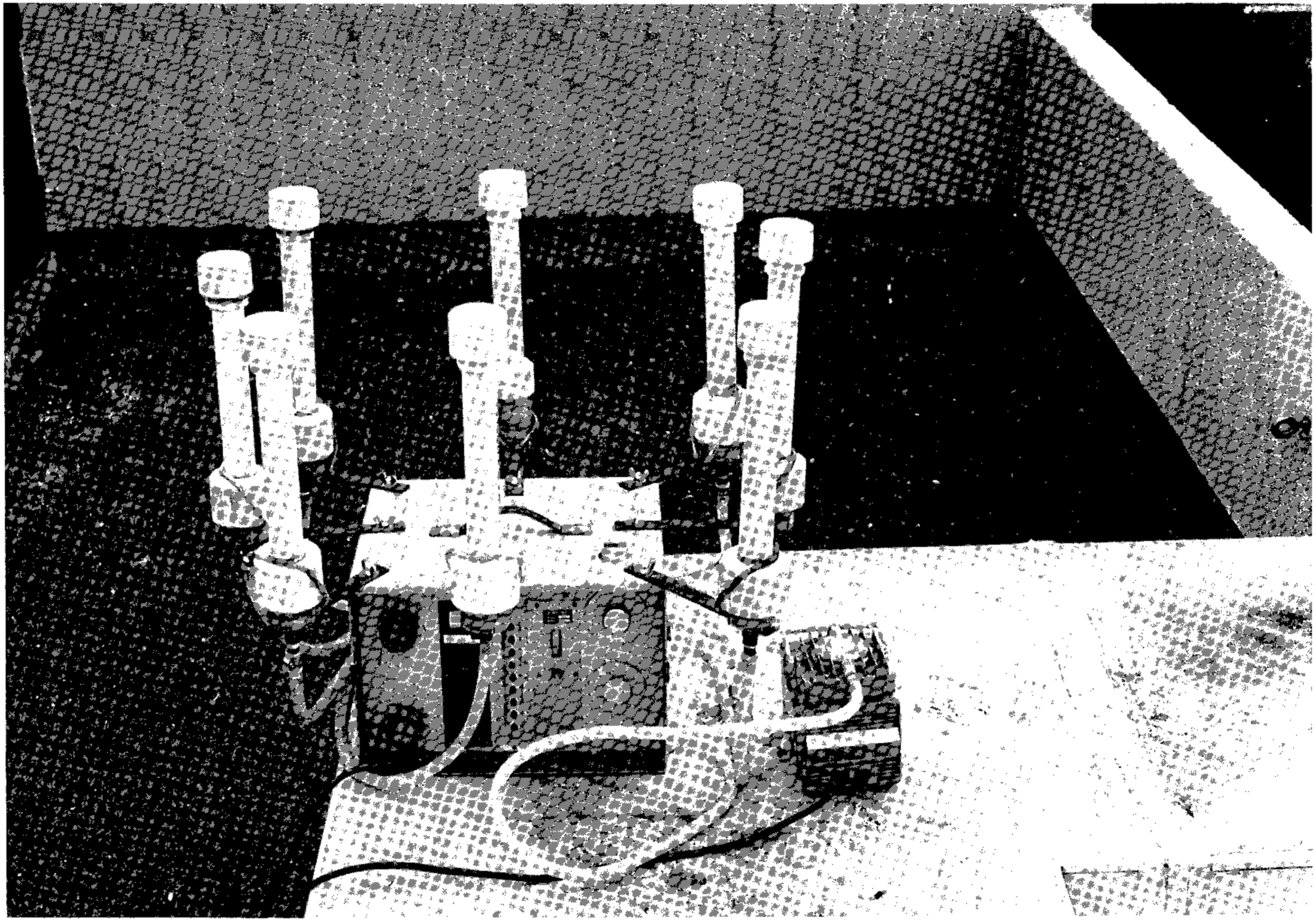


FIGURE 3
MODIFIED MULTIDAY UNIT

TABLE 1

SFU-MODIFIED MULTIDAY COMPARISON
(Concentrations in ng/m^3)

SAMPLING PERIOD	Fine Si		Total Si		Fine Fe		Total Fe		Fine S	
	SFU	MD	SFU	MD	SFU	MD	SFU	MD	SFU	MD
1	666	619	1563	1712	58	34	168	142	342	241
2	714	399	3408	993	49	15	311	69	534	170
3	630	704	2079	1952	56	34	228	175	265	516
4	832	782	5763	3957	66	68	543	418	501	374
5	1429	825	8222	5931	111	72	850	630	465	261
6	1755	2248	6520	7150	141	120	735	693	573	439
7	868	947	5522	5554	56	55	587	569	411	352
8	760	822	5666	4444	44	50	543	483	447	480
9	1713	747	7433	5646	65	50	605	494	676	793
10	654	785	4719	4982	46	51	513	538	585	501
11	484	833	6545	6844	72	63	744	787	618	632
12	376	295	4197	2517	50	25	452	286	868	255
13	259	525	3015	6539	46	43	673	700	234	293
14	331	609	6608	5795	56	57	782	654	513	510
15	175	347	2677	4256	27	27	306	481	323	190
16	212	882	5953	7701	36	74	645	875	234	223
	r=.60		r=.67		r=.81		r=.84		r=.35	

Comparison of SFU and weekly averages of the modified multiday for selected elements.

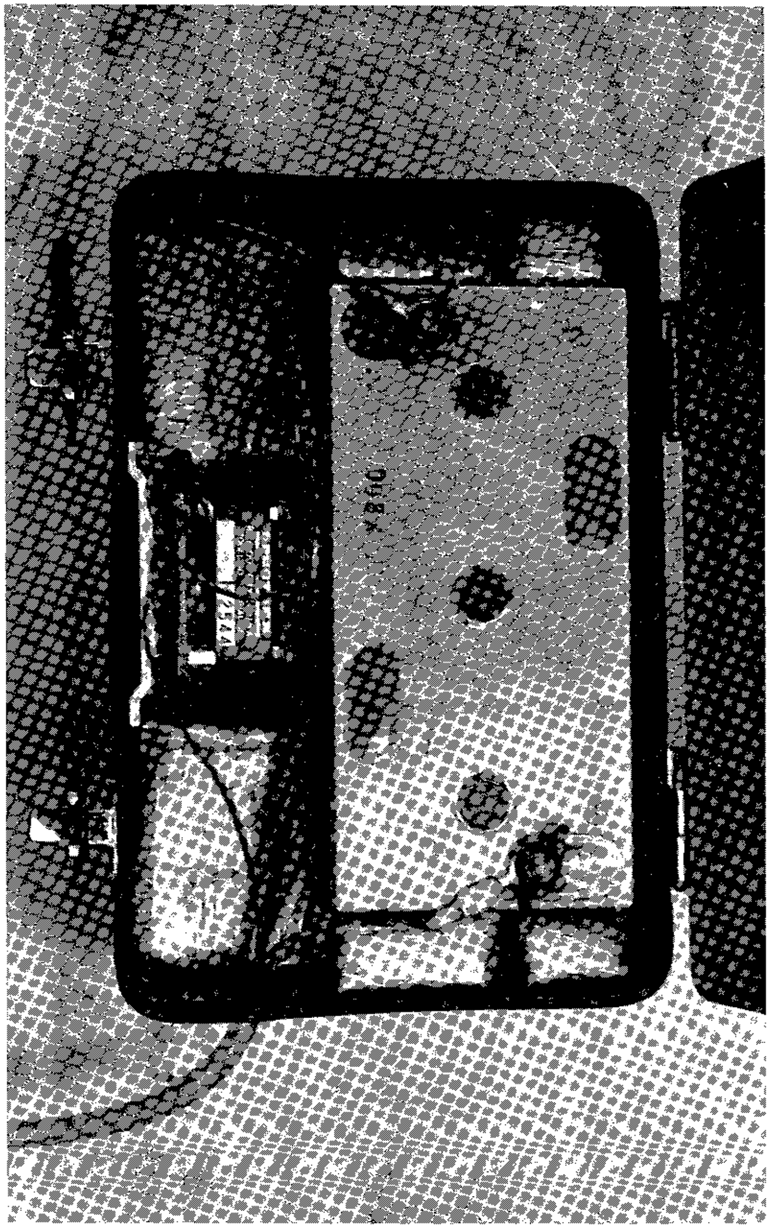


FIGURE 4
BATTERY AND PUMP FOR BPU

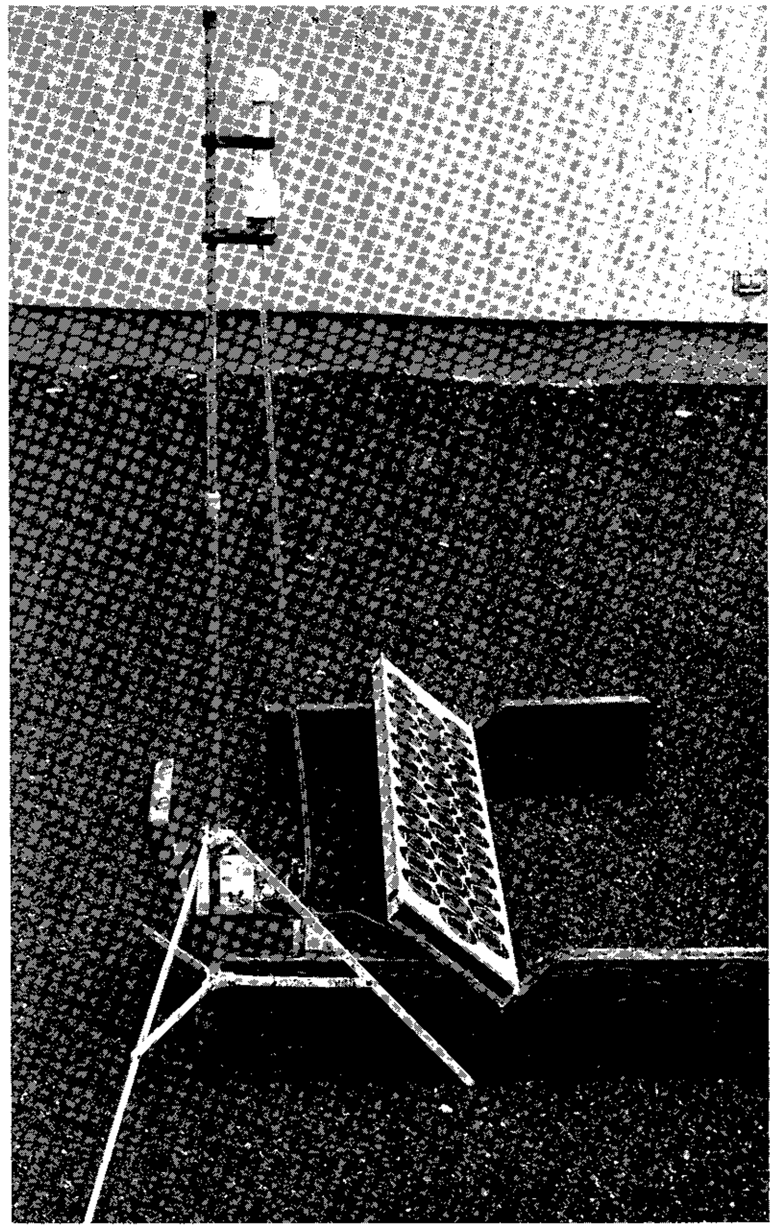
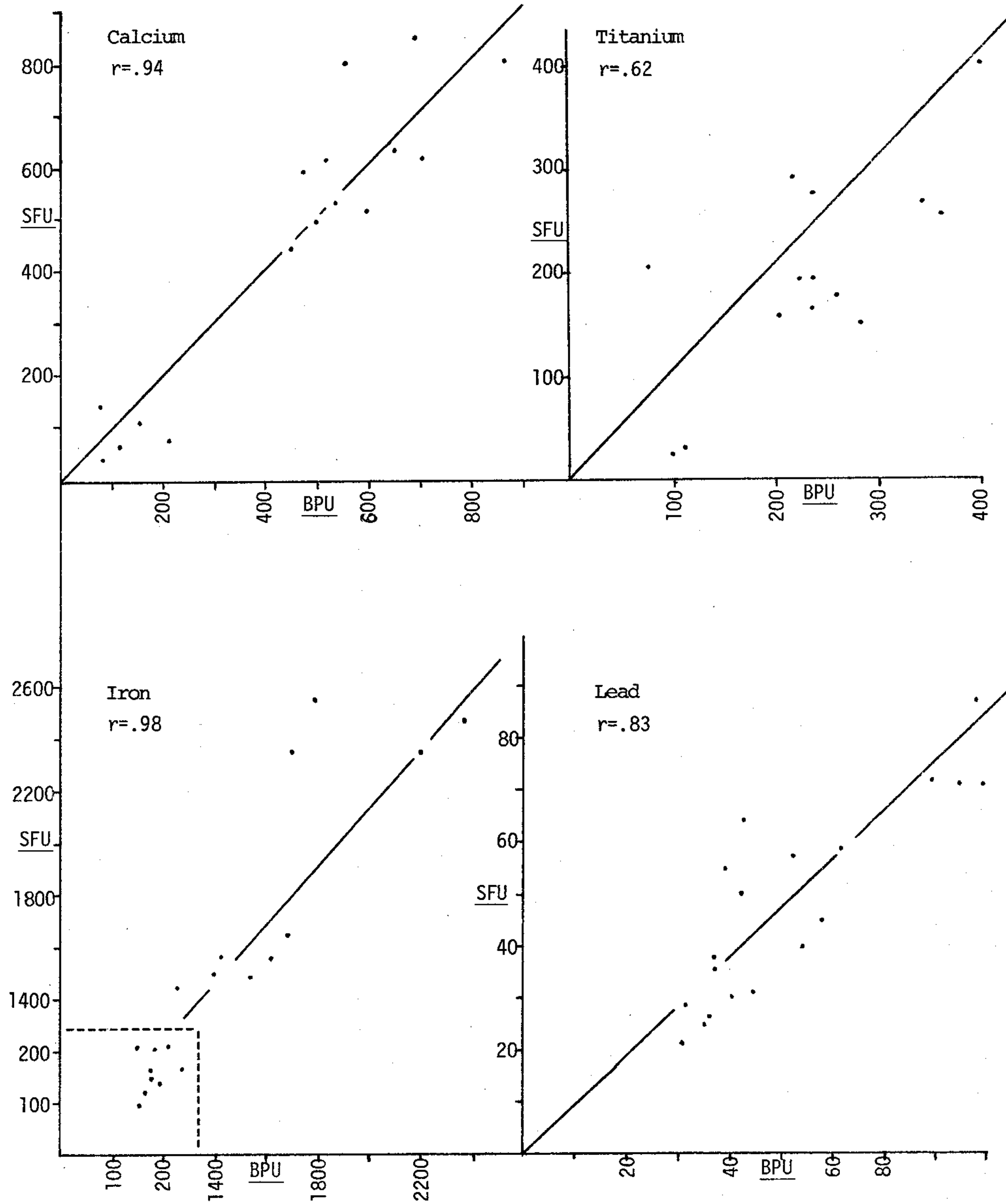


FIGURE 5
SOLAR ASSISTED BATTERY POWERED UNIT (BPU)

FIGURE 6

SFU - BPU Comparison of Selected Elements

XRF Analysis (concentrations in nanograms per cubic meter)



3. GRAVIMETRIC ANALYSIS OF AEROSOL SAMPLES

The total suspended particulate mass in both of the size ranges may be obtained by weighing each of the filters. Since the mass collected by an SFU filter is several orders of magnitude less than that collected by a standard Hi-Vol sampler, a sensitive balance which is accurate to 1μg is needed. If this requirement is met, accuracy and precision comparable to that obtained with a Hi-Vol is obtained, since the ratios of deposit weight to blank weight are comparable for the two samplers, as shown in Table 2. Note that the deposit to blank ratio is three times better for Nuclepore than for other membrane filters.

In addition, the low hygroscopicity of the membrane filters compared to Whatman 41 or fiberglass, greatly reduces humidity effects. Of all filters tested, the Nuclepore membranes have the lowest hygroscopicity.

An estimate of the precision that can be obtained from SFUs can be determined through side by side tests of multiple units. Numerous tests have been performed for twenty-four hour duration runs using 10 l/min. flow rates. For Nuclepore filters on both the coarse and fine stages, the precision in the gravimetric analysis of the collected mass averages $\pm$ 4%, for units with coated coarse filters, flow control on the pumps, and mass determination by a Cahn Model 25 electrobalance. This results in a precision in the particulate mass value of $\pm 0.5 \mu g/m^3$ for each size range under conditions of low particulate mass in the atmosphere. These tests include many sources of uncertainty beyond those associated with the gravimetric analyses, including flow rate, filter area, handling losses, intake variations, etc.

The precision of gravimetric analysis for the stacked filter unit was also calculated from data collected in a recent study in Oregon. The SFU's were operated for twenty-four hours at ten liters per minute. During the course of the study, two scales were used to determine gravimetric mass; a standard Mettler mechanical balance, recently serviced, and a Cahn elecro-balance. Prior to weighing the filters, the electrostatic charge was removed. Filters were weighed, placed in petri dishes, and retained for twenty-four hours. Filters were then reweighed. A precision of $\pm 9 \mu g/m^3$ was recorded

TABLE 2 COMPARISON OF GRAVIMETRIC ANALYSES

	HI-VOL Fiberglass or W41	SFU Coarse or fine stage Nuclepore	SFU Fine stage GA-1 or Fluoropore
Areal Density	8 mg/cm^2	1 mg/cm^2	3 mg/cm^2
Filter Area	500 cm^2	17 cm^2	17 cm^2
Filter Mass	4000 mg	17 mg	51 mg
Flow Rate	1400 l/m	10 l/m	10 l/m
Volume of Air (24 hrs.)	2000 m^3	14 m^3	14 m^3
Mass of Deposit(1)	200 mg	0.48 mg	0.48 mg
Ratio of Deposit to Blank Filter	5%	3%	1%

(1) Assumes a total particulate density of $100 \mu g/cm^3$ of which 1/3 is larger than $15 \mu m$, 1/3 between 3 and $15 \mu m$, and 1/3 is smaller than $3 \mu m$.

by the mechanical balance for both stages, while the electrobalance achieved a precision of $\pm 0.3 \mu g/m^3$ for the coarse stage filter and $0.1 \mu g/m^3$ for fine stage filters (Nuclepore $0.4 \mu m$).

4. X-RAY ELEMENTAL ANALYSIS OF AEROSOL SAMPLES

The samples collected by the stacked filter units are well suited for elemental analysis using x-rays, excited by x-ray sources (x-ray fluorescence, or XRF), or by ion beams (particle induced x-ray emission, or PIXE). Numerous SFU samples have been analyzed using the PIXE system at U.C. Davis. Table 3 lists the minimum sensitivity in micrograms/cm^2 for the major elements collected by SFU samplers on a variety of filter substrates. The average minimum sensitivity for Nuclepore is 1/2 that of Fluoropore, 1/3 that of GA-1, and 1/7 that of W-41. Similar ratios would be generated by other x-ray based analytical systems in which the filter substrate must be analyzed together with the deposit. The quoted sensitivity for the U.C. Davis system is for 120 second irradiation, the standard time used for low sensitivity (and low cost) analyses of multiple elements on air filters by PIXE. Higher sensitivities can be gained for well loaded filters by longer PIXE irradiations or use by XRF, although the former increases cost, and the latter deletes the light elements Na through Cl.

Elemental values from x-ray analyses must be corrected for the absorption of x-rays between the point of emission, and when they leave the sample. Three types of effects may be present with SFU filters: (1) particle size effects, produced by the absorption of x-rays before they leave the particle; (2) loading effects which involve absorption of x-rays by the deposit which lies on top of the particle containing the emitting atom; and (3) penetration effects for cellulose (GA-1 and Millipore AA) and teflon (Fluoropore and Mitex) filters, which occur when particles penetrate the filter, so that the filter medium absorbs x-rays. The SFU coarse stage corrections include only particle size effects for an $8 \mu m$ filter operating between two and twenty liters per minute. Nuclepore size corrections include particle size effects only, while for the other substrates, penetration effects must

TABLE 3 MINIMUM SENSITIVITIES FOR VARIOUS SUBSTRATES FOR TYPICAL TWO-MINUTE ANALYSIS RUN. CONCENTRATIONS IN MICROGRAMS/CM²*

	Nuclepore ($1 \mu g/cm^2$)	Fluoropore ($3 \mu g/cm^2$)	GA-1 ($3 \mu g/cm^2$)	W-41 ($8 \mu g/cm^2$)
Al	.14	.20	.30	.53
Si	.13	.20	.29	.53
S	.10	.18	.27	.52
Cl	.09	.18	.28	.55
K	.06	.13	.18	.42
Ca	.04	.09	.13	.31
Ti, V	.03	.09	.12	.29
Cr	.03	.08	.11	.25
Mn	.03	.07	.10	.23
Fe	.03	.07	.10	.22
Ni	.02	.06	.08	.17
Cu	.02	.05	.07	.14
Zn	.02	.06	.09	.16
Br	.04	.10	.13	.37
Pb	.08	.20	.25	.70

* PIXE system, U.C.Davis

also be made. For the fine stage, loading corrections should also be included (the total correction is a product of individual corrections). It must be stated that the corrections currently used were only after making many assumptions regarding the chemical and size characteristics of the deposit, and thus represent approximations valid only for typical ambient aerosols. They may be seriously in error in source-enriched locations that have abnormal particles in large numbers.

5. DESCRIPTION OF X-RAY ANALYSIS SYSTEM

A diagram of the analysis system is shown in Figure 7. An 18 MeV alpha beam from the cyclotron passes through the sample and is collected by the Faraday cup, which measures the total charge Q that passes through the sample. The number and energy of the x-rays produced in the sample are measured by a Si (Li) detector and associated pulsed optical feedback circuitry. Major effort was expended in the design of the electronics to measure this number accurately, including proper dead time corrections.

The number of characteristic X-rays, N_z, produced by a transition of element z, depends on the areal density $(\rho t)_z$ of the element in the sample according to

$$N_z = A_z (\rho t)_z Q$$

where A_z is a constant determined by gravimetric standards. A best value for each transition was obtained by fitting the values measured for thirty standards to a polynomial expansion. The estimated uncertainty in the absolute value of any elemental concentration is ten percent.

Verification of the accuracy of the system has been made by (1) formal and informal interlaboratory comparison, (2) selected reanalysis of samples using PIXE after approximately one year. In all cases, the errors are routinely less than ten percent.

Tests have determined that there is very little loss of material from exposure to vacuum, beam irradiation, or long term storage. The only detectable loss was a 25% decrease in halogens when the sample was irradiated for sixty-four times the normal charge.

All elemental concentrations are corrected for matrix effects due to the absorption of the X-rays as they pass through the sample. A small

UCD-ARB AEROSOL ANALYSIS SYSTEM

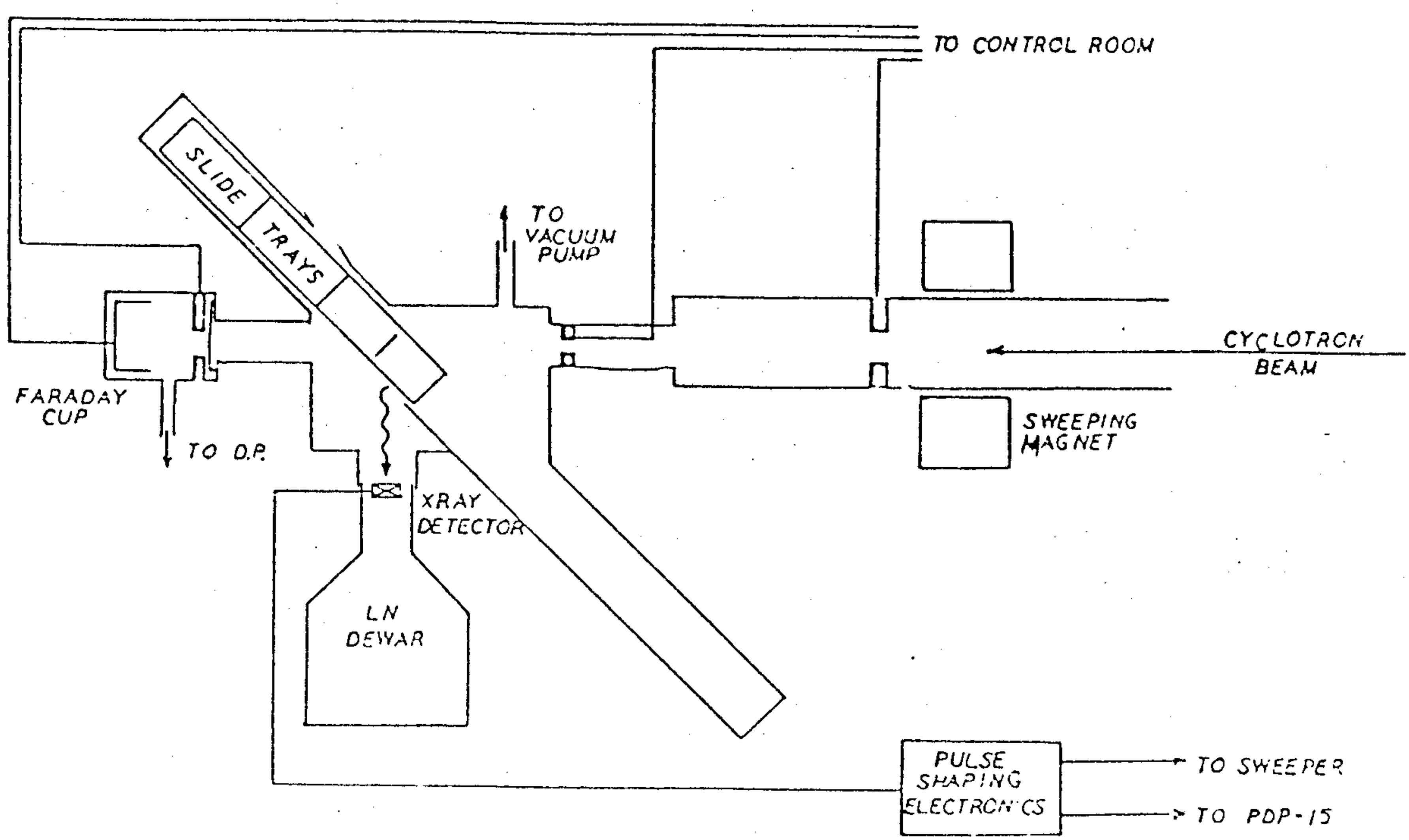


FIGURE 7

correction is made for the absorption from particles lying on top of the particle containing the atom which produced the x-ray. Corrections exceed five percent only for sodium and aluminum. A second correction is made for absorption by the material in the particle containing the atom; this is largest for large particles and low z elements. For the first stages of the Multiday and of the stacked filter unit, the correction for sulfur is approximately thirty percent.

6. QUALITY ASSURANCE PROGRAMS

The accuracy and precision of all data included in the Mono Lake study are subject to quality assurance procedures. These procedures are used in all aspects of this program, from particulate collection through data reduction. A formal third party review by Rockwell International under the direction of the U.S. Environmental Protection Agency has been part of this program since 1979. The formal protocol document is lengthy, but key elements as they bear on the Mono Lake project are identified below.

6.1 SAMPLE COLLECTION

Most samples were collected via stacked filter units, and quality assurance procedures were used on particulate sizing and on the elemental analysis of ambient aerosol samples. The size segregation is based on filter pore size, flow rate, and filter coating. Hence, filter characteristics are critical. All filters used were manufactured in a single batch process and the material used was checked for trace element contamination. Pore size and particle cut-off were verified through work of the Air and Industrial Hygiene Laboratory, State Department of Public Health, Berkeley, under ARB contract. Anti-bounce coatings were applied by U.C.Davis at the factory, and coating densities were verified in laboratory field tests. All were sealed and stored at Davis prior to use. Field measurements of flow rate were made using an orifice meter. The orifices were made by precision drilling a thin steel plug. These orifices were then calibrated using a Collins Spirometer which is accurate to $\pm$ 1%.

By integrating the flow rate over the time of collection the volume of air was determined. In no case did a significant (>20%) change of flow occur during the program on the normal units.

6.2 SAMPLE ANALYSIS

Two types of sample analysis were conducted; mass using a Cahn 25 micro-balance, and elemental content using the proton induced x-ray emission (PIXE) system at Davis. The Cahn 25 was calibrated using type S weights. The results of the Rockwell audit, of 9/81 indicated agreement to $\pm$ 10μg, which is equivalent to $\pm$ 0.1μg/m^3 in the 7 day samples.

The PIXE analyses system is subject to an extensive and continuing quality assurance program. The program includes:

a) The PIXE system is calibrated by 10 weighed elemental standards, certified by Micromatter, Inc., Seattle, Wash.

b) The results are checked by comparison with literature x-ray emission values for the ion beam and detector efficiency.

c) The system is validated through use of comparisons against the UCD XRF system, special EPA plastic foils from the Physics & Chemistry Division Research Triangle Park, and participation in intercomparison studies. The last published study was an EPA/DOE test in 1978 for Si, S, Ti, Fe, Zn, Se, Br, and Pb. The PIXE system at Davis had a ratio of 0.98 $\pm$ 0.08 (actual/measured) for all elements analyzed.

d) The Rockwell International elemental intercomparisons have just begun, and will be used to ensure the accuracy and precision of the system.

In summary, the PIXE analysis system has achieved mean accuracy, and precision for <u>all</u> such tests since 1973 of 1.03 $\pm$ 0.07 (actual/measured). Therefore the quoted $\pm$ 10% errors are conservative. Precision in element to element ratios is $\pm$ 2%.

7. SITE DESCRIPTIONS AND SAMPLING METHODOLOGY

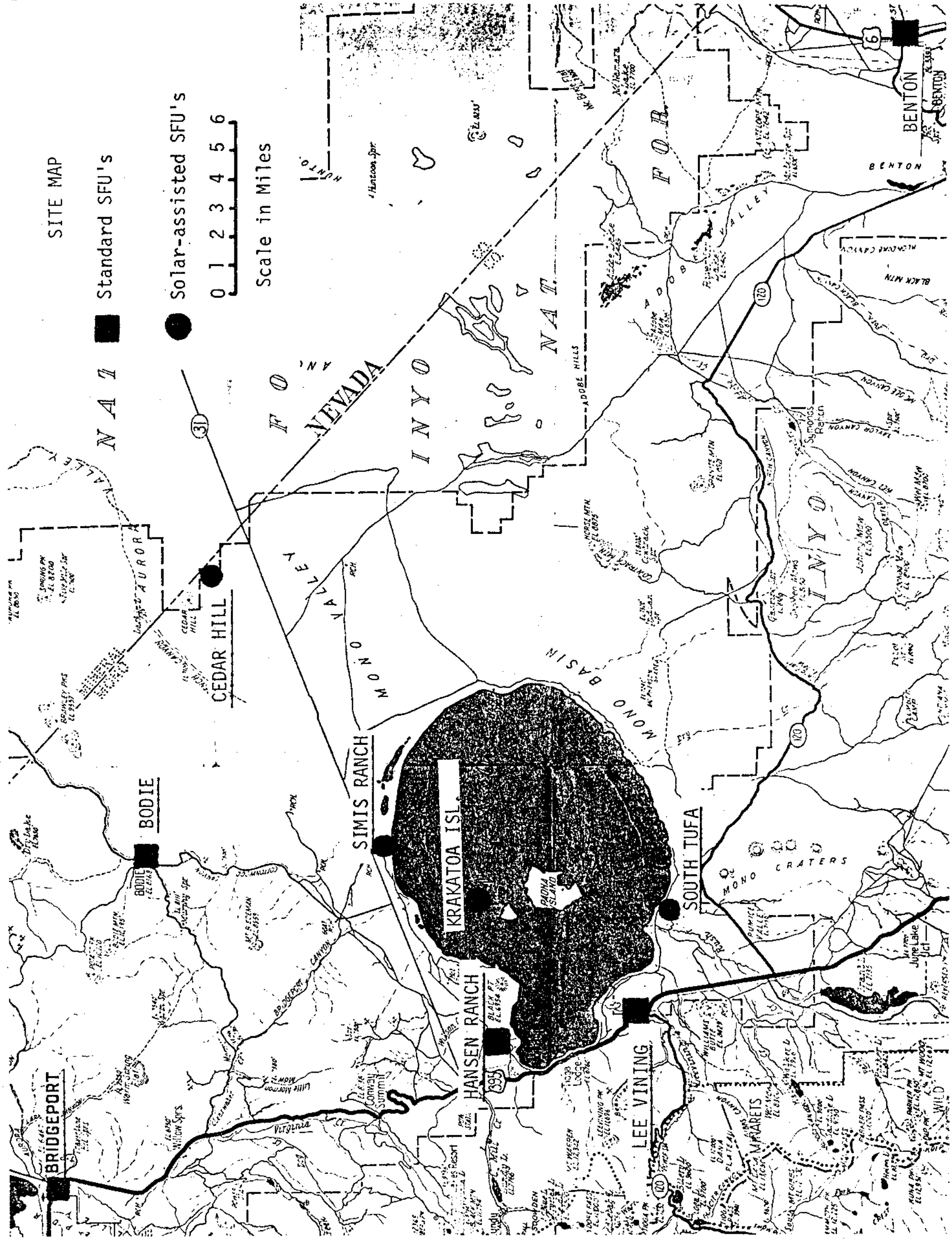
Sampling sites were selected in order to provide representative samples of particulate aerosol in the Mono Lake basin. The use of battery powered units permitted sampling in areas lacking electrical power.

7.1 WEEKLY MONITORING

The standard stacked filter units (SFU's) were set up at four sites around the lake on May 13, 1979. Each sampler was used to collect a weekly integrated aerosol sample. Figure 8 shows the sampling sites in the basin. Site 1 was located in Lee Vining, the major population center in the basin. The sampler was set up behind the high school, east of Highway 395, about 1 1/2 miles from the southwest shoreline. It was moved to the nearby Cal-Trans yard midway through the sampling period (due to vandalism at the original site). Site 2 was located on the property of the Hansen family, approximately 1000 feet from the northwest shoreline of Mono Lake near Mill Creek. Benton was the location of the third SFU, near the house of Mr. Elmer Christie, east of Road 6, 28 miles east-southeast of Mono Lake. The fourth SFU was first located north of the lake in Bridgeport 16 miles away. After 7 weeks it was moved to the ghost town of Bodie, 10 miles due north of the lake in the Bodie hills. These four SFU's were run for seven consecutive days each week at a flow rate of 10 liters per minute. Sampling ended on October 27, 1979 for a total of 24 weekly sampling periods.

Battery powered units were set up at two sites on August 20, 1979. One was placed about one mile from the north shoreline on the Simis' property, south of Road 167. The second battery powered unit was set up 300 ft. from the south shoreline, just west of the South Tufa Towers. These units were run for seven consecutive days at a flow rate of 1 liter per minute. Equipment problems led to reliable data for only 6 weeks at the Simis site and 4 weeks at the South Tufa site.

FIGURE 8



SITE MAP
Standard SFU's
Solar-assisted SFU's
0 1 2 3 4 5 6
Scale in Miles
BRIDGEPORT
BODIE
CEDAR HILL
SIMIS RANCH
KRAKATOA ISL.
HANSEN RANCH
LEE VINING
SOUTH TUFA
BENTON
NEVADA
MONO VALLEY
MONO BASIN
MONO CRATERS
PAOHA ISLAND
ADOBE HILLS
ADOBE VALLEY
BENTON
June Lake Jct

All of the weekly monitoring sites were maintained and operated by Charles Fryxell, The Great Basin Air Pollution Control District Officer, and his employees Don Harjo and Bill Cox. Pre-weighed filters were placed in filter holders at U.C. Davis and mailed via UPS to Mr. Fryxell in Bishop. The operator would then drive to each site, measure the air flow before and after the filters were changed with a spirometer calibrated orifice meter and return this information with the exposed filters to U.C. Davis. Upon arrival at UCD, the filters were post-weighed and prepared for x-ray analysis.

7.2 SPECIAL STUDIES

On four occasions intensive 24 hour sampling was conducted. These daily samples were collected to characterize both very clean and dirty days due to blowing lake bed dust. Table 4 lists these intensive sampling periods and the observed weather conditions. Only one of the intensive sampling periods was conducted during a significantly windy period.

TABLE 4

INTENSIVE SAMPLING PERIOD	OBSERVATIONS NOTED BY SAMPLER OPERATORS
July 15-17, 1980	Occasional blowing dust
August 18-20, 1980	Occasional blowing dust
October 26-28, 1980	Calm and Clear
November 27-December 1, 1980	Significant sustained winds

The sites used for these studies included the 6 sites used for weekly sampling described above as well as additional sites, including: 7) the Benderup's property near the north shore, 8) Krakatoa Island and 9) Cedar Hill, near the California-Nevada border, 12 miles northeast of the lake.

Continuous daily sampling was conducted using the modified multiday impactor at one site. The sampler was located at the Hansen site for 6 weeks, and then moved to the Lee Vining site for the remaining 18 weeks. The sampler was run at 20 liters per minute and provided data on the daily gravimetric as well as elemental composition of the aerosol samples.

7.3 SOILS

Soil samples were collected from the surface and several centimeters below the surface at all of the aerosol sampling sites. In addition soil samples were taken at several other locations around the lake. These samples were resuspended and analyzed by PIXE to help determine the source of ambient aerosols found in the Mono Lake area. In addition samples of the exposed lake bed were also collected at several sites around the lake.

RESULTS AND DISCUSSION

8.1 OWENS VALLEY-MONO LAKE MONITORING, SPRING, 1979

Early data on particulate matter at Mono Lake was gathered as part of the California Air Resources Board program, "A Study of Ambient Aerosols in the Owens Valley Area," J.B. Barone, B.H. Kusko, L.L. Ashbaugh and T.A. Cahill, November 1979. Mean weekly totals of gravimetric mass in the less than 15μm particle size range were obtained for seven sites in the Owens Valley for the period February 20 to June 18, 1979. During part of this period, April 24-June 18, 1979, monitoring was conducted at the Hansen ranch near Mono Lake. Figure 11 shows the average total mass for each week found at Mono Lake. While the mean particulate mass at Mono Lake was less than that of the average of Owens Valley sites, the Mono Lake to Owens Valley ratio being 0.59 ± 0.28, the patterns were very similar. Episodes of sharply increased mass were superimposed on a steadily rising curve during this period. Detailed elemental analysis of the composition of the ambient dusts and their potential sources showed that the increased mass episodes in the Owens Valley corresponded with alkaline dust storms that contained a large measure of salts from the dry Owens Lake bed. The smoothly rising portion of the curve appeared to be due to increasing desication of the entire valley floor as spring advanced into summer. The presence of coarse particulate chlorine and sulfur in the two elevated episodes at Mono Lake during the weeks starting April 24 and May 7, 1979, shows some lake bed influence. No other periods at Mono Lake had such a signature. Nevertheless, even in these periods, soil particulates dominated the total mass, with only about a 5 ± 3 percent contribution from the Mono Lake playas. This study also indicated that the meterological conditions at Mono Lake are similar to the better know behavior of Owens Valley, and that under similar conditions of soil moisture, similar ambient particulate matter concentrations are observed. By late June, the Mono Lake ambient particulate concentrations were 0.98 ± 0.09 of the Owens Valley values.

8.2 MONO LAKE MONITORING 1980

Weekly monitoring data are shown in Figures 11 through 15 for gravimetric mass, silicon, iron, and sulfur.

FIGURE 9

MEAN WEEKLY TOTAL AND FINE GRAVIMETRIC MASS

OWENS VALLEY - MONO LAKE COMPARISON 1979 and 1980

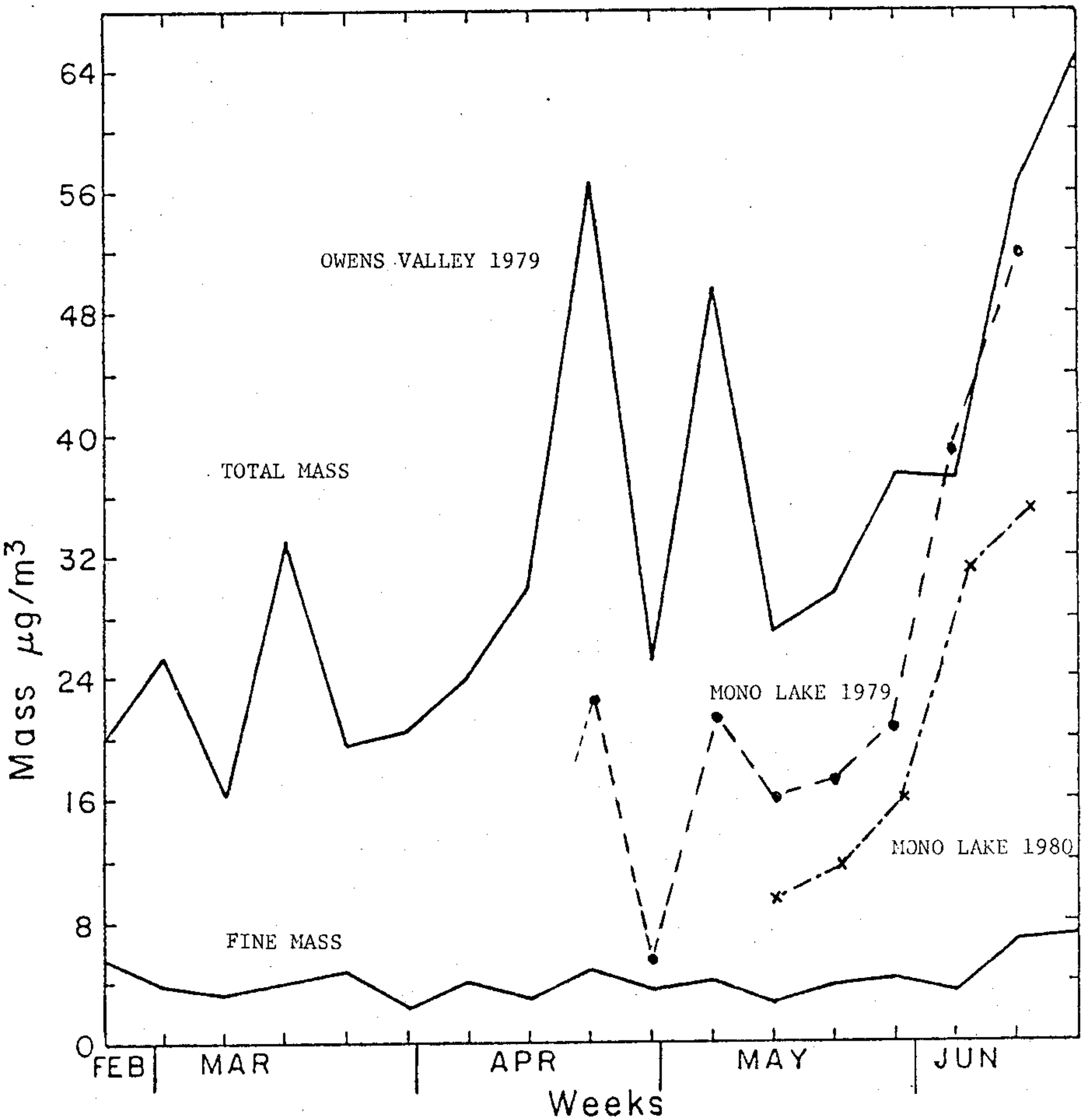
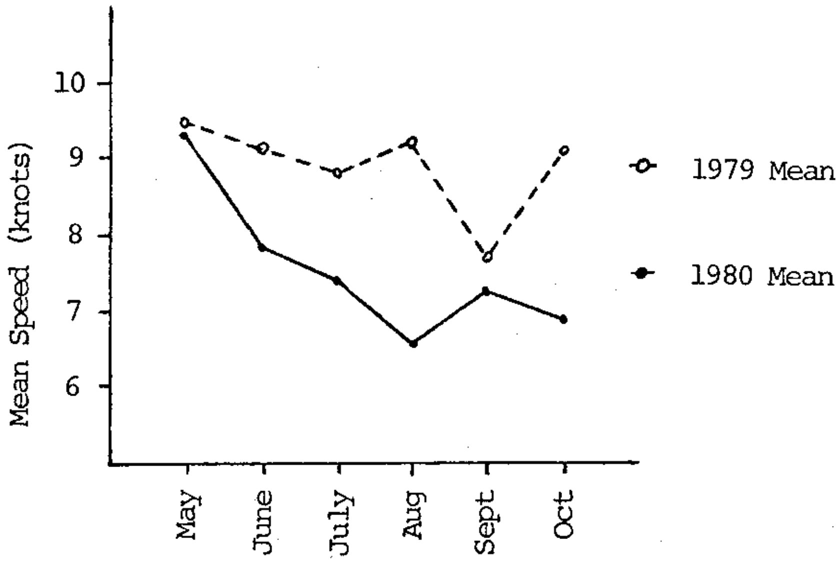
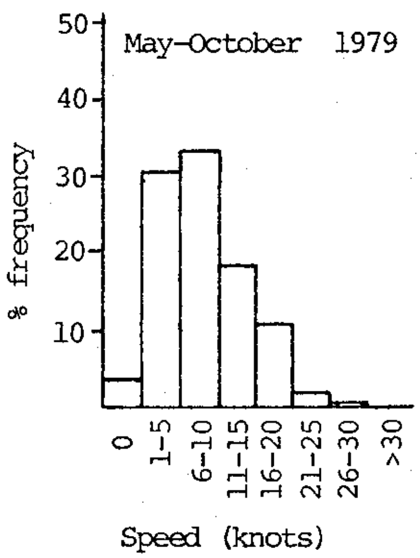


FIGURE 10

Bishop Wind Speed Data - 1979 vs 1980





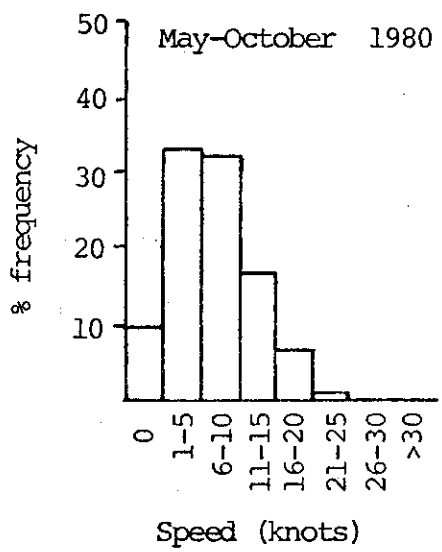


TABLE 5

BISHOP WIND SPEED

1979

Speed	May	June	July	Aug.	Sept.	Oct.	Total	%	
0	5	3	8	4	5	3	28	3.4	
1-05	30	36	44	46	55	46	257	30.9	
6-10	63	56	49	30	35	45	278	33.4	
11-15	30	34	22	29	14	28	157	18.8	
16-20	19	10	18	16	13	18	94	11.3	Mean=8.93 kts
21-25	2	4	3	3	1	2	15	1.8	
26-30	1	0	1	1	0	1	4	0.5	
30	0	0	0	0	0	0	0	0	
Mean Speed	9.53	9.13	8.79	9.19	7.63	9.13	833	100	

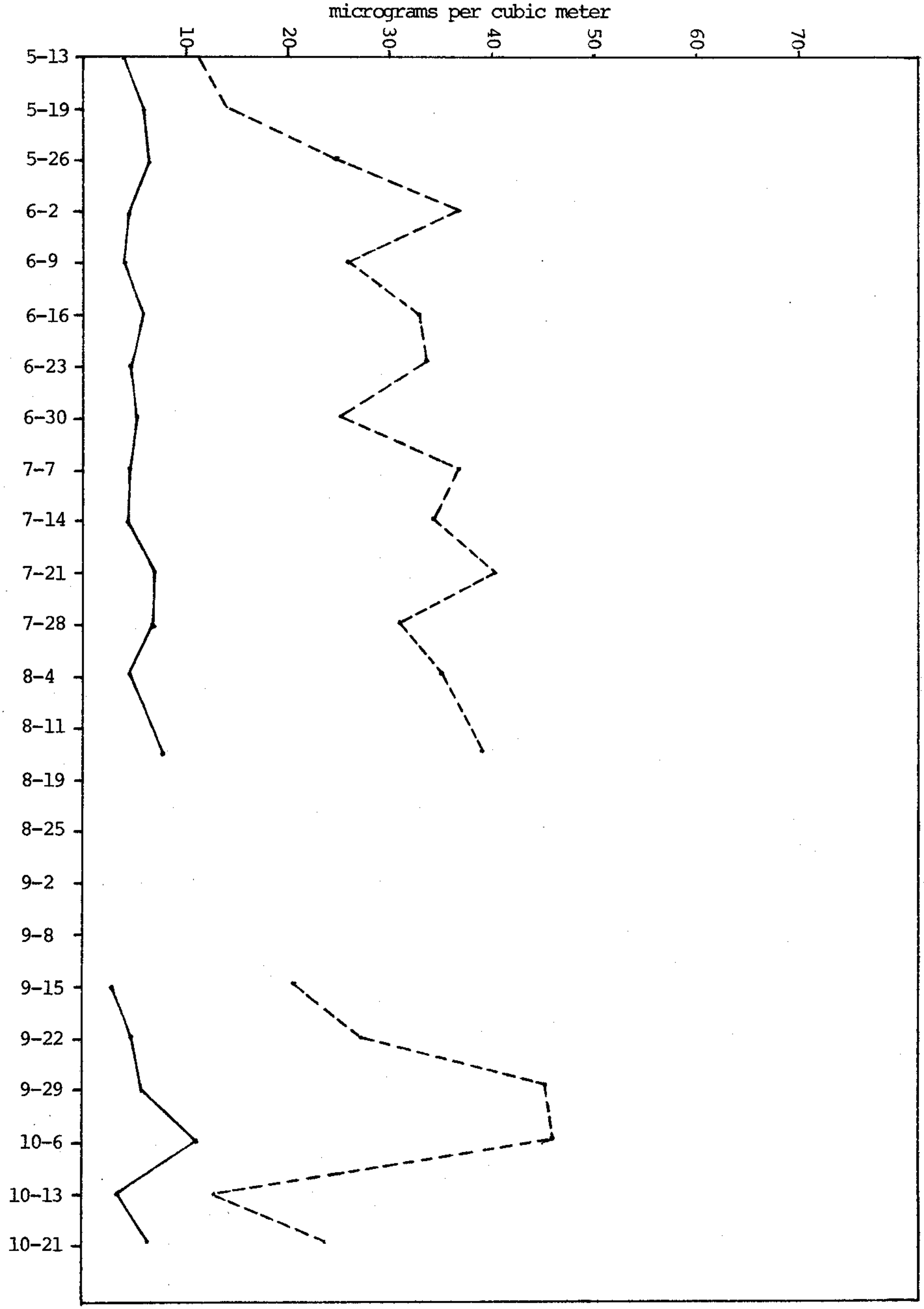
1980

Speed	May	June	July	Aug.	Sept.	Oct.	Total	%	
0	6	10	19	16	10	20	81	9.7	
1-05	38	43	47	56	48	45	277	33.1	
6-10	51	56	40	50	34	42	273	32.6	
11-15	33	26	27	22	21	13	142	17.0	Mean=7.55 kts
16-20	20	8	10	3	6	12	59	7.0	
21-25	1	1	1	0	1	0	4	0.5	
26-30	1	0	0	0	0	0	1	0.1	
30	0	0	0	0	0	0	0	0	
Mean Speed	9.33	7.81	7.38	6.56	7.23	6.83	837	100	

8.2.1 MONITORING OF GRAVIMETRIC MASS

Gravimetric mass data at Hansen's ranch show the same behavior in 1980 that they did in 1979, with an increase in June as the surface soils dried out. The values for 1980, however, were only 52% of those for the same period of 1979, confirming local reports that 1980 was a relatively wet year in the Mono Lake basin, and that average wind speeds were significantly less in 1980 than in 1979. Once this rise had occurred, gravimetric values averaged around 30μg/m^3 until the fall when sharply elevated values, up to 70μg/m^3, were measured. While the pattern of rising values in spring occurred at all sites, major differences were also evident in the mass values from site to site. Bridgeport had the lowest average mass values, while Benton and Bodie had the highest. Note that little lake influence was expected at either Bridgeport or Benton. Lee Vining had a major rise in June, 1980, twice the value at Hansen's ranch, however the fall differences were much more modest, reaching only about 40μg/m^3. The fall increase at Hansen's ranch was also seen at Bodie, and at similar levels, while no such increase was seen at Benton. In fact, those parameters dominated by coarse mode mass (15μm to 2.5μm diameter), including total gravimetric mass and soil-like particles such as silicon and iron, showed little correlation between Benton and the other sites. This might be expected due to the shorter residence times of coarse mode particles in the air. It should be noted however, that the spring dust storms in 1979 showed increases in mass at both Owens Valley and Mono Lake sampling sites, suggesting that synoptic scale meteorologic conditions may have an important influence on measured concentrations over large distances during some conditions.

Figure 10 and Table 5 shows mean wind speeds measured at Bishop during similar time periods in 1979 and 1980. Bishop, located midway between Mono Lake and Owens Dry Lake, has a National Weather Service Station where wind speed measurements were made during daylight hours. Although this data may not be representative of true mean wind speeds, the 1979-1980 differences are significant, and may help explain why ambient particulate concentrations were lower in 1980 than 1979.



Weekly Monitoring of Gravimetric Mass
(Average of all sites)

FIGURE 11

8.2.2 MONITORING OF SELECTED ELEMENTS

Two elements typically associated with soils, silicon and iron, are shown in Figures 13 and 14. These two elements were chosen because they are not a large fraction of the mass in the playas of the lake, but are a significant proportion of the surrounding soils. One result in evidence at all sites is that the particles collected are predominantly in the coarse size range, (2.5 to 15 microns). Typical ratios of coarse to total mass were 0.90 for these elements. Except under very strong winds conditions such particles cannot travel far before settling. This is suggested by the large concentration variations at each site. Significant soil contributions to the total mass were seen at a single site often (soil episode), for example, at Lee Vining on the week of June 2, at Hansen's ranch on the week of June 9, at Benton on the week of July 7, and at Bodie on the week of August 4. Several soil episodes occurred at more than one site; for the week of September 29 high soil levels were seen at Lee Vining and Hansen's ranch but not at Benton. The Bodie filter was damaged so no information for this site was available. All four sites exhibited elevated ambient concentrations for the week of August 11. The sensitivity to local influence for coarse soil derived particles makes detailed interpretation difficult. It can be stated that soil derived particles (the elements Al, Si, K, Ca, Ti, Mn, Fe and their oxides) dominates gravimetric mass at all sites for most periods. The correlations between sites that occur can be explained by the similar response of exposed soils to synoptic meteorology. The lack of strong similarities suggest the sampling period had a low incidence of large scale windstorms.

Non-soil type particles of interest include elements known to be common in the playas and tufa formations of Mono Lake. Sulfur and chlorine in the coarse particle (2.5 to 15 microns) are generally produced from the exposed lake bed materials. These elements were commonly found in the lake bed soil samples, but were rarely seen in soils away from the lake. The only anthropogenic source of sulfur in the basin is automotive exhause which would produce fine particle sulfur (less than 2.5 microns), and since no anthropogenic source of chlorine exists in the area, man made emission of coarse particle sulfur or chlorine is negligible. Long range transport of these large

FIGURE 12a

Weekly Monitoring of Gravimetric Mass

Fine (particles less than 2.5 microns)
Coarse (particles 2.5 to 15 microns)

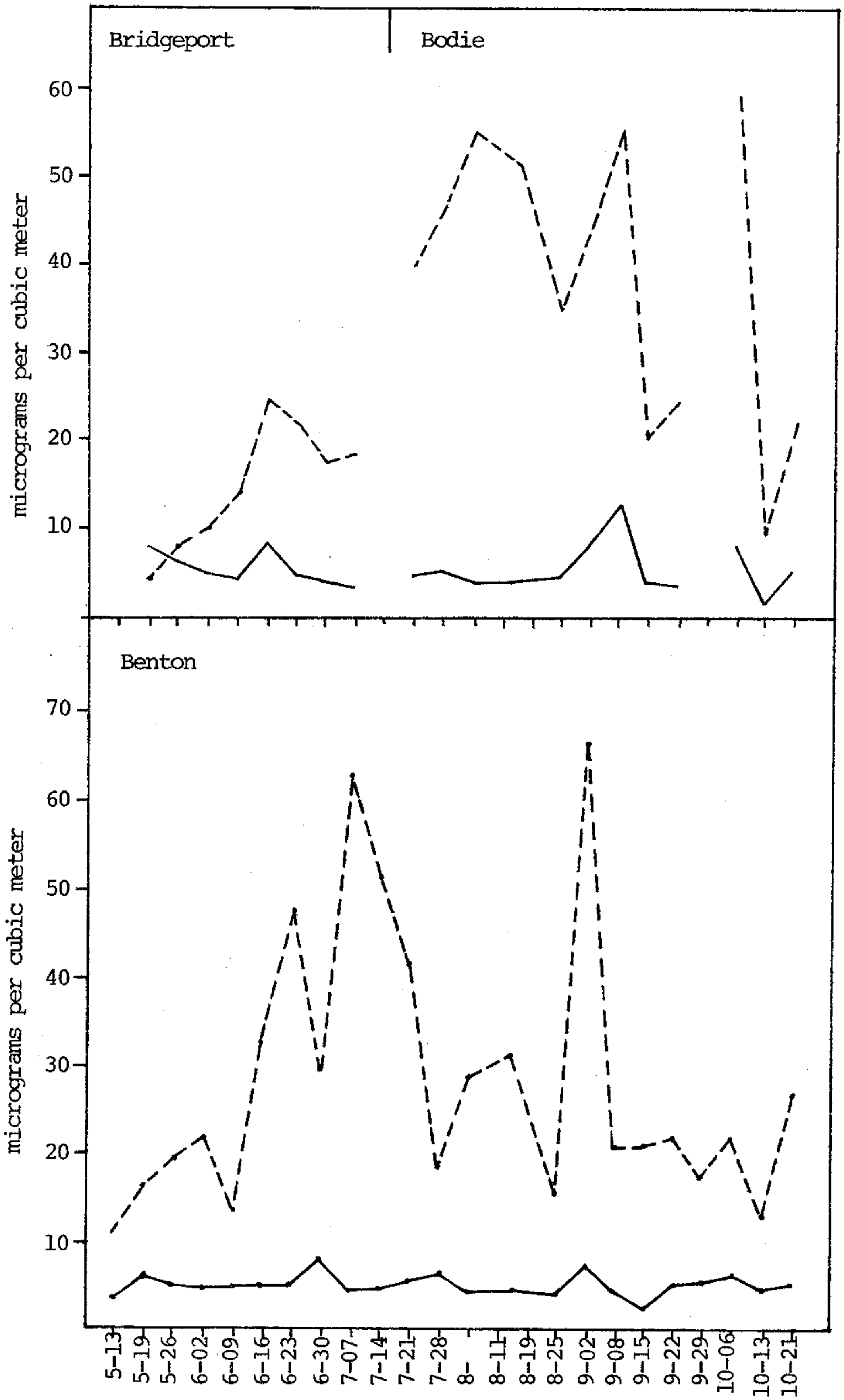


FIGURE 12b

Weekly Monitoring of Gravimetric Mass

Fine (particles less than 2.5 microns)

Coarse (particles 2.5 to 15 microns)

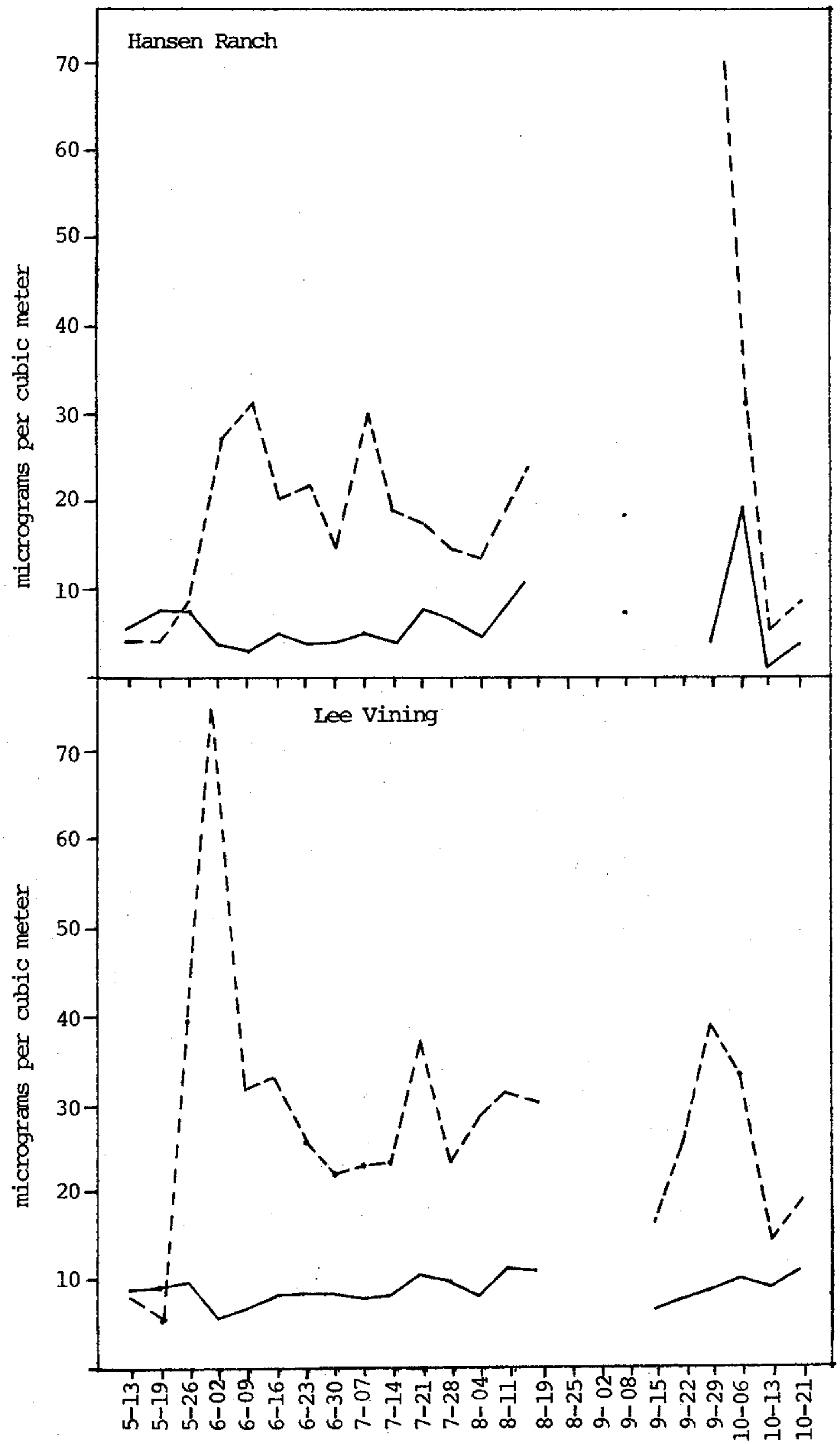
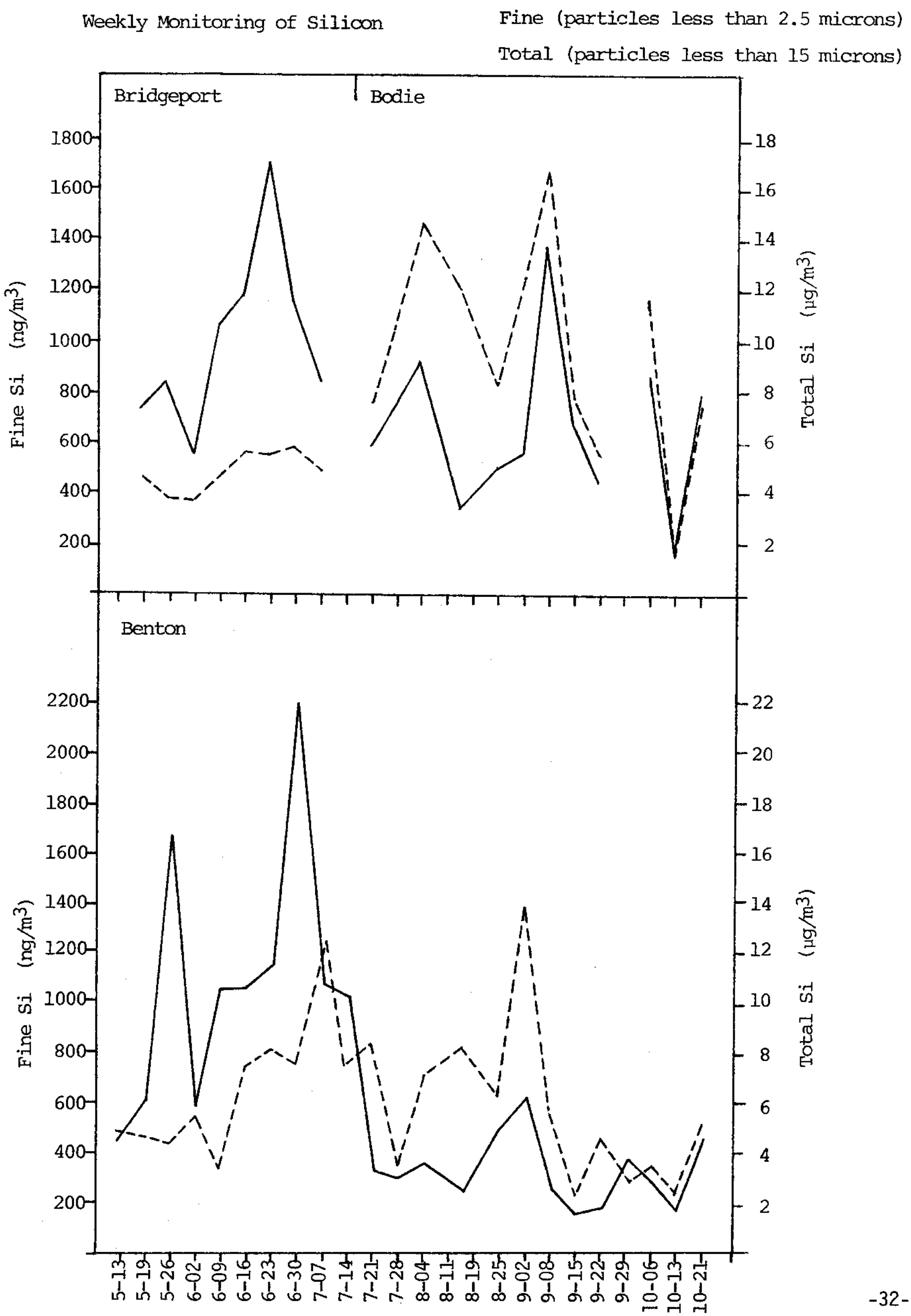
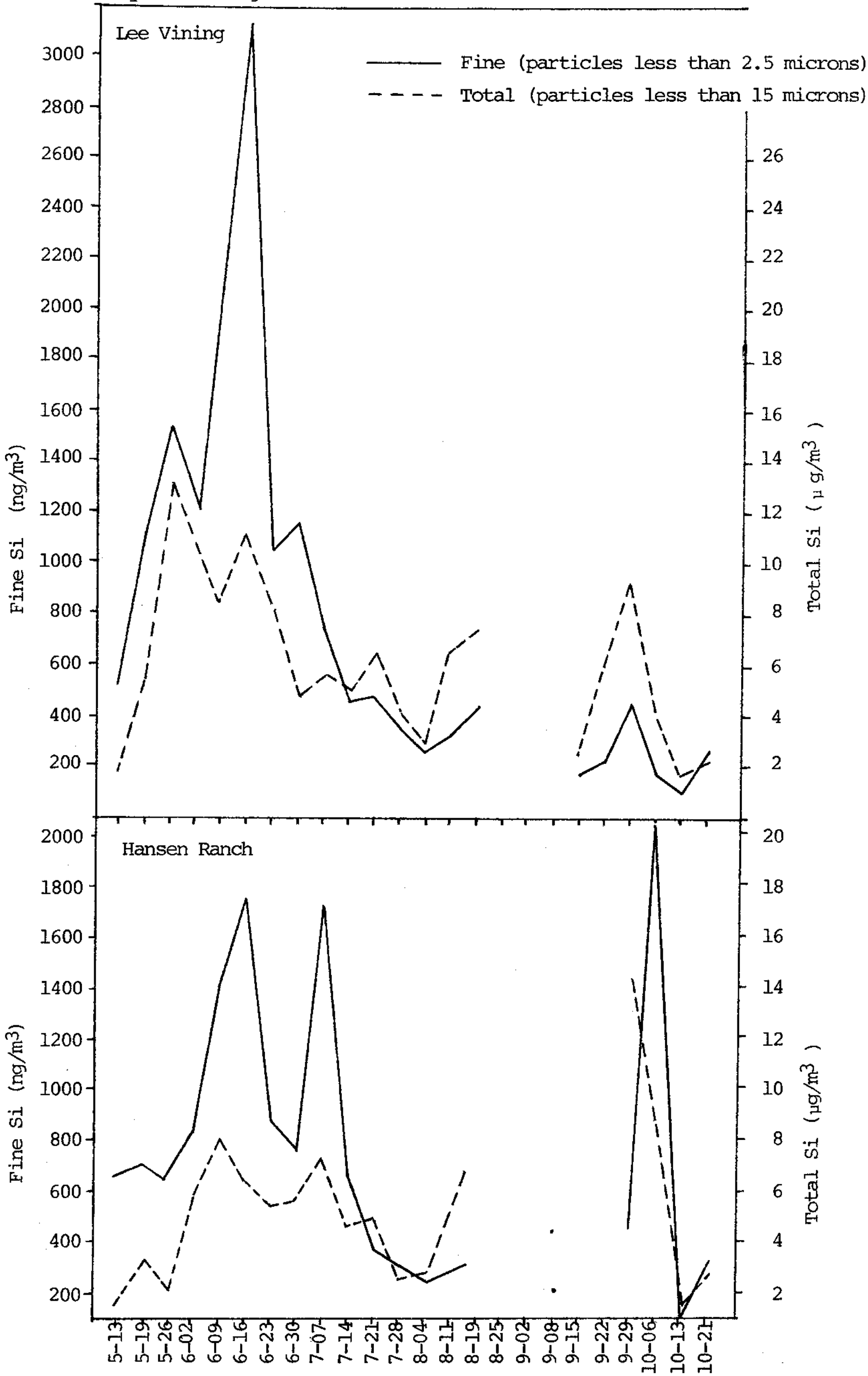


FIGURE 13a

Weekly Monitoring of Silicon





Lee Vining
Fine (particles less than 2.5 microns)
Total (particles less than 15 microns)
Fine Si (ng/m3)
Total Si (μg/m3)
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
26
24
22
20
18
16
14
12
10
8
6
4
2
Hansen Ranch
Fine Si (ng/m3)
Total Si (μg/m3)
2000
1800
1600
1400
1200
1000
800
600
400
200
20
18
16
14
12
10
8
6
4
2
5-13
5-19
5-26
6-02
6-09
6-16
6-23
6-30
7-07
7-14
7-21
7-28
8-04
8-11
8-19
8-25
9-02
9-08
9-15
9-22
9-29
10-06
10-13
10-21

FIGURE 14a

Weekly Monitoring of Iron

Fine (particles less than 2.5 microns)

Total (particles less than 15 microns)

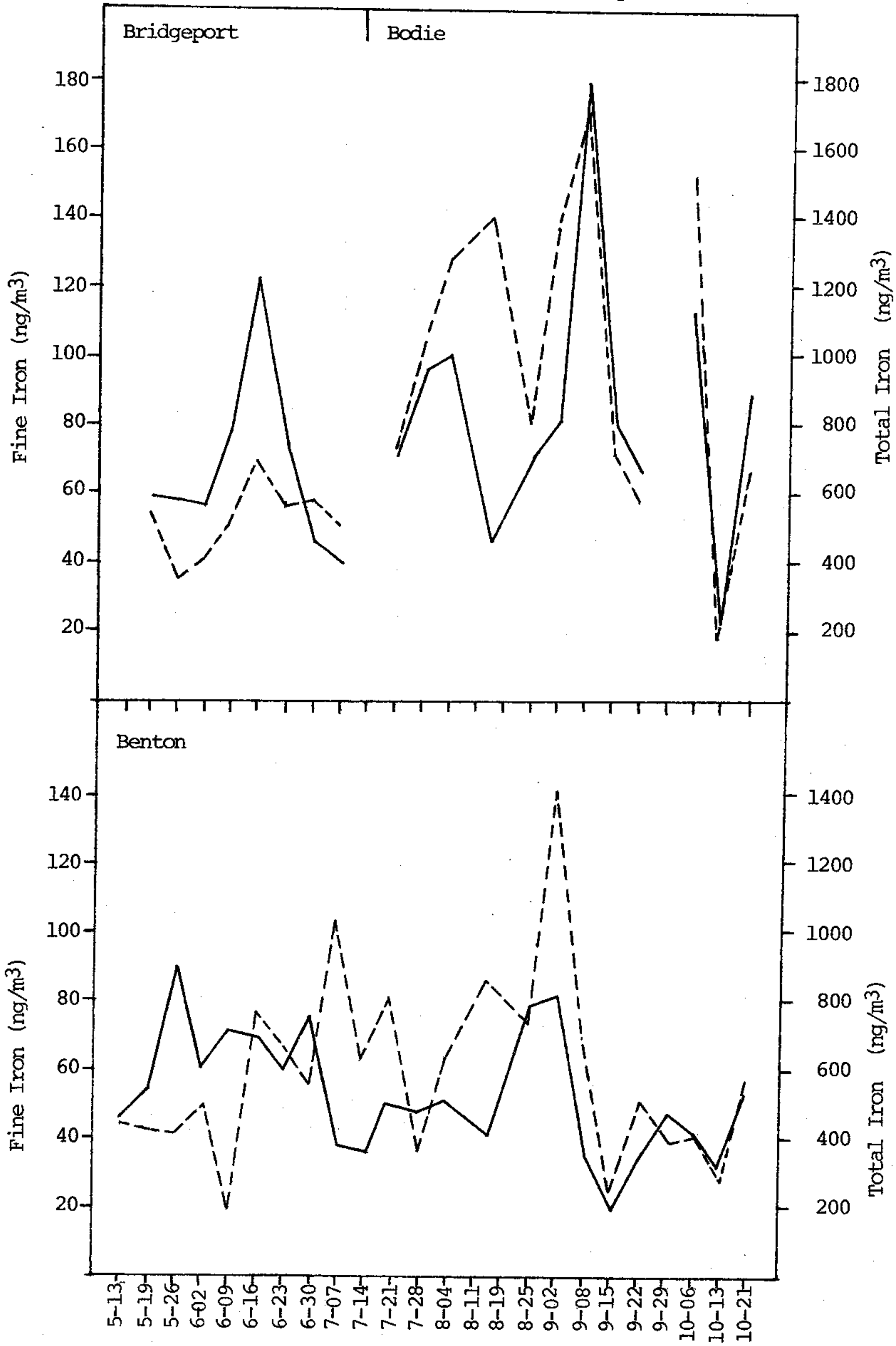


FIGURE 14b

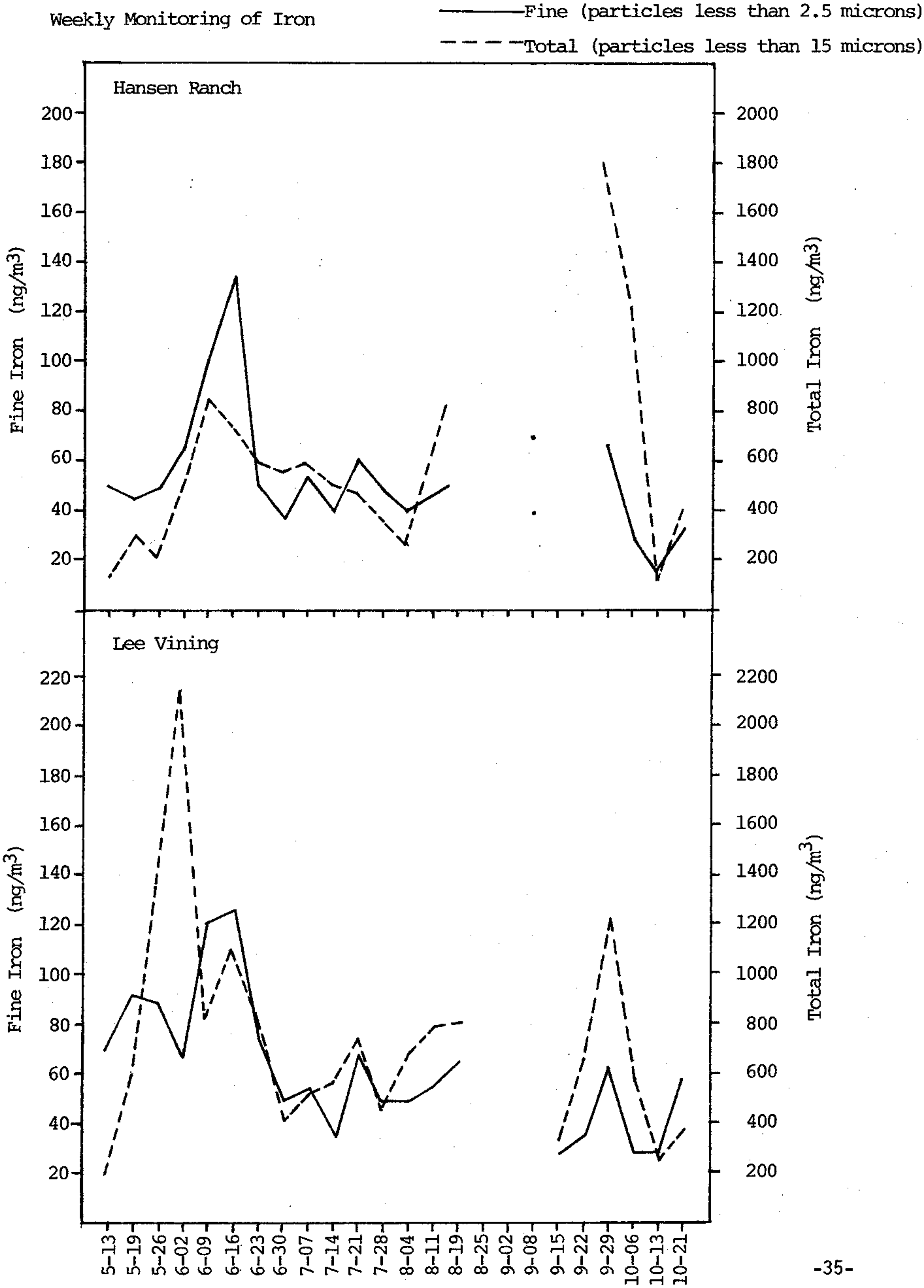
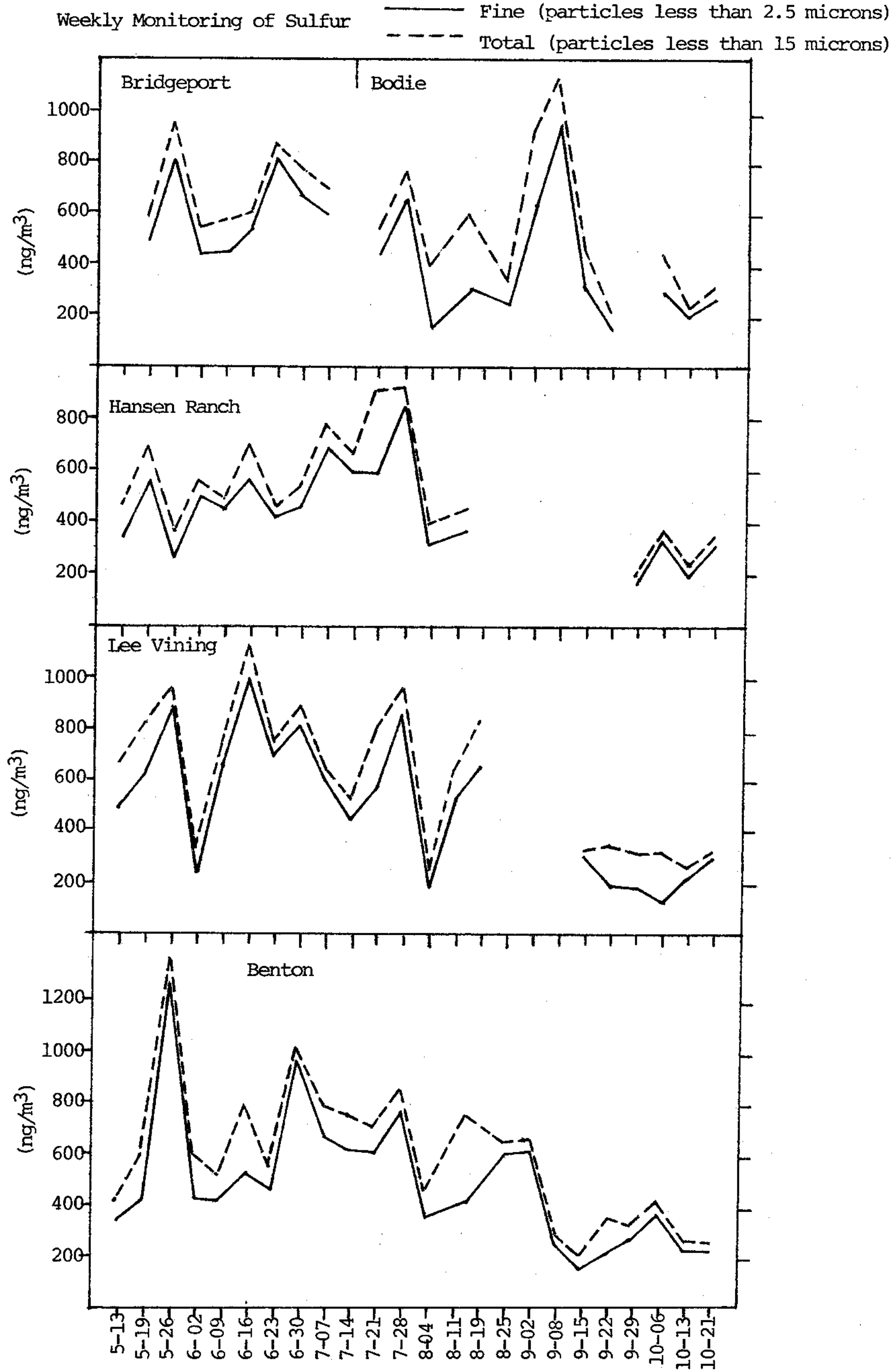

Weekly Monitoring of Iron
Fine (particles less than 2.5 microns)
Total (particles less than 15 microns)
Hansen Ranch
Lee Vining
Fine Iron (ng/m3)
Total Iron (ng/m3)
200
180
160
140
120
100
80
60
40
20
2000
1800
1600
1400
1200
1000
800
600
400
200
220
2200
5-13
5-19
5-26
6-02
6-09
6-16
6-23
6-30
7-07
7-14
7-21
7-28
8-04
8-11
8-19
8-25
9-02
9-08
9-15
9-22
9-29
10-06
10-13
10-21

FIGURE 15


Weekly Monitoring of Sulfur
Fine (particles less than 2.5 microns)
Total (particles less than 15 microns)
Bridgeport
Bodie
Hansen Ranch
Lee Vining
Benton
(ng/m3)
1000
800
600
400
200
1200
5-13
5-19
5-26
6-02
6-09
6-16
6-23
6-30
7-07
7-14
7-21
7-28
8-04
8-11
8-19
8-25
9-02
9-08
9-15
9-22
9-29
10-06
10-13
10-21

particles from outside the basin may be disregarded due to the short residence times they have in the atmosphere. Fine particle sulfur is generally produced by gas to particle conversion of sulfur dioxide to sulfate aerosols or by direct production of sulfates through the burning of fossil fuels. These fine particles have long residence times in the atmosphere and may be transported into the area from far away. In the Owens Valley study of 1979, sharply elevated levels of coarse particle sulfur and chlorine were measured downwind of the dry Owens Lake bed during strong valleywide windstorms For these reasons, sulfur and chlorine in the 2.5 - 15 micron range were investigated at Mono Lake.

The results for sulfur, shown in Figure 15, indicate that the ambient sulfur aerosol is mostly in the fine particle mode; less than 2.5 microns. Furthermore, a stong relationship between sulfur concentrations at all four sites, for both weekly patterns and average values are shown in the data. Mean summer values of fine sulfur aerosol for the five sites were:

Bridgeport	614 ± 148 ng/m^3	(5/19 - 7/15/80)
Bodie	388 ± 255 ng/m^3	(7/21 - 10/25/80)
Lee Vining	505 ± 268 ng/m^3	(5/13 - 10/28/80)
Hansen Ranch	443 ± 308 ng/m^3	(5/13 - 10/28/80)
Benton	482 ± 257 ng/m^3	(5/13 - 10/28/80)

These values are similar to those found at Lake Tahoe and suggest long range transport may be responsible for the fine sulfur aerosol found in the area. In addition, little change in mean particle size distribution was seen at the sites close to the lake. Thus, the lake bed contribution to ambient sulfur levels in the Mono Lake vicinity during 1980 was not significant.

A comparison of the sulfur to iron and chlorine to iron ratios measured at Hansen's ranch was made for the same period in 1979 and 1980. Table 6 shows these ratios as well as silicon to iron and titanium ratios for the coarse particle mode. Fe/Fe was taken to be 100. The lake bed derived aerosols increased significantly in 1980 while soil derived aerosols showed only a slight increase.

TABLE 6

1979-1980 Comparison of Selected Elements

	S/Fe		Cl/Fe		Si/Fe		Ti/Fe	
	1979	1980	1979	1980	1979	1980	1979	1980
May 13	6.7	80.0	9.0	234.5	708	816	7.6	<10.0
May 21	22.2	52.6	<6.5	16.9	604	1028	8.6	6.9
May 26	10.4	47.1	<6.1	114.5	696	842	8.4	4.7
June 2	<1.3	12.6	<2.7	12.8	657	1034	8.5	7.3
June 9	7.4	3.2	<2.9	3.6	788	919	6.5	7.6

8.3 SPECIAL STUDIES

Several studies were incorporated into this program to gain more information on the ambient aerosols found in the Mono Lake area. First, soil samples were taken near the air sampling sites, from the exposed lake bed, the land bridge to Negit Island and from surrounding soils. These were resuspended at U.C. Davis and analyzed for elemental composition. Secondly, a daily sampler was operated for the entire 24 week sampling period. This provided data on short term fluctuations of aerosol concentration. The lower mass loadings on the filters, however, resulted in a decrease of sensitivity compared to the weekly samples. The third special study included several weekly and daily sampling periods around the lake where continuous electric power was not available. For this purpose solar assisted battery powered units were used.

8.3.1 SOIL SAMPLES

Soil samples taken in the Mono Lake area were brought to U.C. Davis for analysis. They were initially sifted, eliminating all particles greater than 50 microns in diameter. The samples were then placed in a resuspension device developed by the U.C. Davis Air Quality Group which was designed to collect particles less than 15 microns to coincide with the inlet cut point of the stacked filter unit. The apparatus is shown in Figure 16 and the results are shown in Table 7. Bandy Black clay, a National Bureau of Standards reference soil, was used as a control. Ratios to Silicon were found to be:

BANDY BLACK ANALYSIS

	$\frac{Al}{Si}$	$\frac{K}{Si}$	$\frac{Ti}{Si}$	$\frac{Fe}{Si}$
NBS Value	46%	4.3%	2.8%	2.5%
Trial 1	51%	6.7%	3.4%	2.3%
Trial 2	47%	5.4%	3.5%	2.3%

These data suggest that the resuspension device should provide a representative sample of suspendable materials less than 15 microns in size.

Analysis of the materials that could be suspended by winds indicated several distinct catagories (Table 8). The soils away from the lake bed are of two types-silicon rich (i.e. Lee Vining) and calcium rich (i.e. Bodie). These materials are often associated with uncovered surfaces, dirt roads, and other potential sources for wind transport.

The lake bed soils, as expected, contained alkaline materials. The surface soils were very typical of earth crustal average soils with an additional sodium and chlorine component. Sub-surface soils, generally in muds that are not resuspendable until dried and exposed, showed similar ratios to surface soils. Tufa deposits, as expected, were almost totally calcium (calcium carbonate).

The efflorescent crust proved to be rather variable in composition, containing mixtures of soil and alkaline materials. However, except for some

FIGURE 16

Resuspension and Sizing System
U.C., Davis

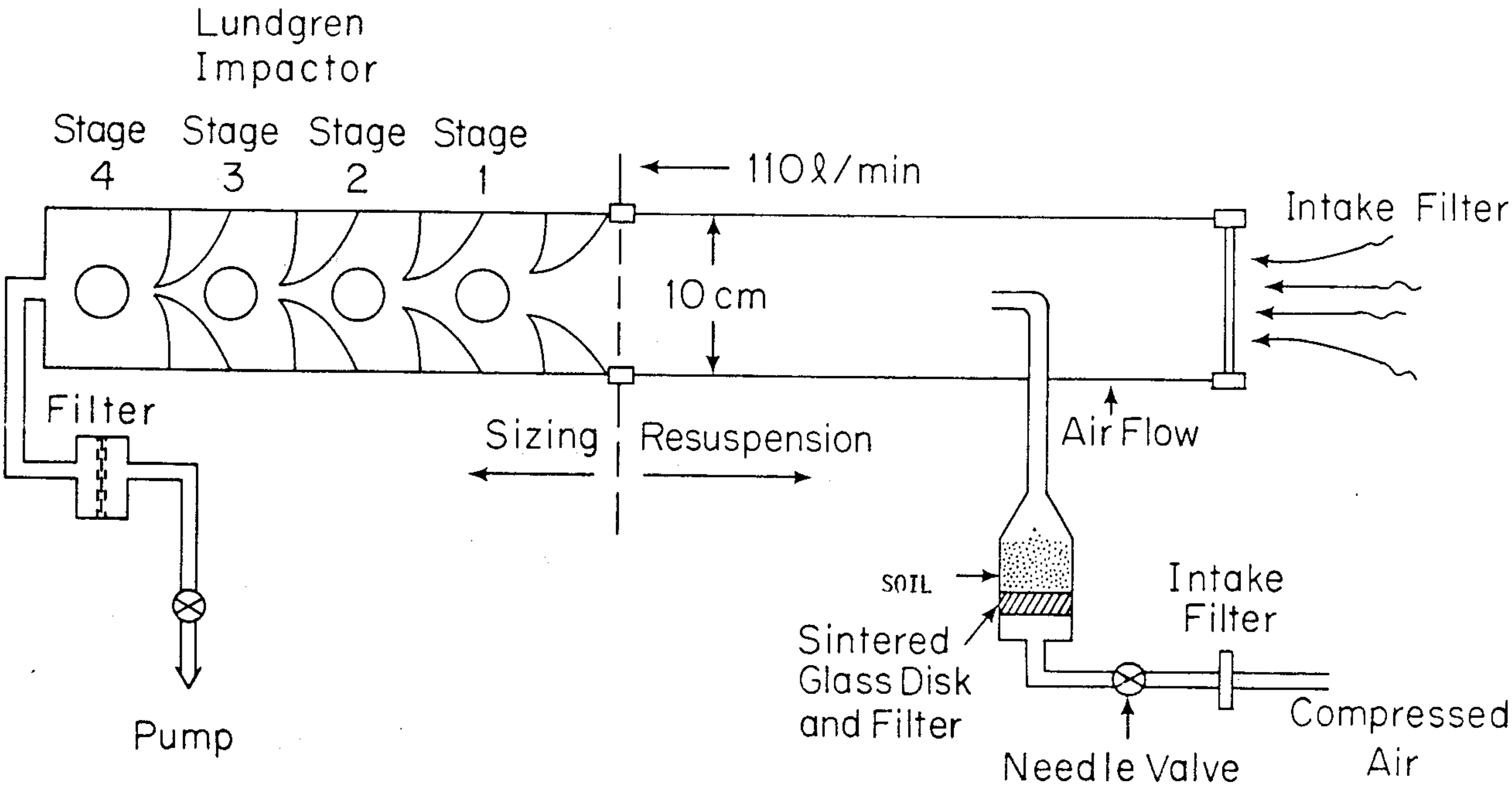


TABLE 7

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE SOIL RESUSPENSION STUDY

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
SOUTH TUFA SOIL	298*	403	7906	60*	50*	48*	1874	2979	40	54	924	18*	16*	23*	26
BLACK PT. ROAD	2651*	1090	8575	602*	501*	476*	1222	633	225	151*	1396	180*	160*	228*	498*
TUFA TOWER	792*	256*	283	167*	138*	132*	95	16070	51*	254	76	49*	34	64*	37
NEAR LAND BRIDGE	20586	289*	723	187*	1378	3924	565	1601	55*	45*	144	54*	48*	71*	65
CRUST	258	220*	129	147*	702	1970	440	655	22	36*	40	43*	38*	55*	122*
DIRT NEAR SHORE	1174*	545	14868	260*	216*	213	691	1095	107	65*	931	77*	23	101*	212*
NEAR LAND BRIDGE	447*	345	3883	90*	74*	70*	252	8335	13	23*	243	28*	25*	34*	72*
CRUST	8464*	2943*	2451*	1963*	1639*	1560*	335	1895	395	489*	510*	585*	447	744*	1610*
CRUST	442*	154*	119	58	85*	86	54*	42	25	26*	27*	31*	27*	39*	85*
TOP SOIL NEAR SHORE	121590	1343*	1092*	863*	6117	23975	10255	2249	252*	206*	215*	247*	220*	367	685*
BEACH DIRT	1048*	2236	13288	222*	184*	174*	1064	4724	250	23	2982	68*	18	83*	182*
BENDERUP	1449*	2165	13552	312*	258*	246*	1411	2810	184	36	1762	51	83*	114*	254*
PINE GROVE-HWY 120	1165*	2637	20934	241*	199*	189*	2522	775	104	60*	1160	71*	64*	88*	192*
SOUTH TUFA ROAD	390	3322	26581	140*	114*	109*	3468	1293	137	10	1595	96	36*	51*	43
LAND BRIDGE	440*	210	3620	97*	81*	42	1092	371	59	15	327	29*	26*	38*	78*
LEE VINING H.S.	655*	4333	23099	103*	83*	79*	2859	1547	332	32	3161	191	27*	36*	26
NEAR LAND BRIDGE	27454	252*	413	159*	1659	5811	842	1617	27	38*	269	27	13	58*	123*
BODIE	672*	224*	3368	147*	122*	116*	2028	1918	71	29	1141	45*	40*	56*	43
LAND BRIDGE	1398*	3441	14232	295*	244*	232*	810	3204	437	33	4053	88*	78*	112*	239*
LAND BRIDGE	861	2801	17687	102*	82*	78*	1910	4933	96	16	1296	29*	29	36*	76*
TOP SOIL	2712*	943*	785*	305	523*	360	328*	229*	191*	157*	164*	188*	103	92	515*
TOP SOIL	7073	3806*	3168*	1443	2111*	670	1324*	925*	767*	633*	660*	440	673*	959*	2096*
BANDY BLACK	713*	7898	15435	141*	116*	110*	1040	50*	524	35*	355	41*	37*	52*	113*
BANDY BLACK	496*	3071	6475	105*	30	83*	352	38*	228	26*	148	31*	27*	40*	86*
PAOHA ISLAND	7999	479	4615	147*	1788	876	789	1247	38	36*	635	43*	38*	54*	116*
SIMIS DIRT	776	1476	11813	436*	362*	344*	1517	6386	100	109*	843	60	116*	162*	350*
SIMIS CRUST	16808	310	4196	665*	973	526*	3447	2219	97	164*	417	197*	175*	251*	536*
LOWER SOIL	1613	273	6002	328*	272*	654	737	3701	39	81*	598	97*	30	124*	111
LOWER SOIL	1114	990*	1517	659*	549*	451	344*	999	125	164*	171*	196*	59	253*	412
DIRT UNDER CRUST	4605	2267	9881	1459*	1214*	992	782	8704	235	363*	1098	178	386*	546*	1200*
DIRT UNDER CRUST	1788*	616*	1266	410*	96	580	480	3658	92	102*	599	122*	54	159*	342*
DIRT UNDER CRUST	2881*	922	6138	659*	549*	568	891	917	266	165*	1206	197*	176*	254*	552*
DIRT UNDER CRUST	4475*	1555*	2728	1054*	863*	341	1085	1629	361	262*	1583	312*	196	398*	859*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

TABLE 8

SURFACE MATERIALS NEAR MONO LAKE

(ratios to Calcium)

	Na	Si	S	Cℓ	K	Ca	Fe
Soils (surface)							
Lee Vining	<40	1500	<5	<5	185	=100	205
Bodie	<35	176	<6	<6	106	=100	60
Soils (lake)							
Surface	45	160	<7	17	20	=100	16
Sub-surface	<50	35	2.6	16	13	=100	16
Tufa deposits	<5	2	<1	<1	0.6	=100	0.5
White Lake Crusts							
Negit Is.	40	20	107	301	67	=100	6
Pahoa Is.	640	370	143	70	63	=100	51
beaches	1200	45	86	245	35	=100	9
beaches	5400	<50	270	1070	456	=100	<10
beaches	1700	25	101	360	52	=100	17
OWENS	209	116	6	22	22	=100	25

Note: Cℓ/s ratio, surface, except Pahoa Is.
3.3±0.5, when both present.

samples from Pahoa Island, the Cl/S ratios were quite constant, (3.3 + 0.5) when both elements were simultaneously present. Pahoa Island samples were soil rich and chlorine poor, (Cl/S ratio of 0.49).

Samples of the crystalline crust were collected by C. Simis from the north eastern margin of the exposed lake bed. These were photographed using a scanning electron microscope (SEM) and analyzed by energy dispersive x-ray analysis by the U.S. Geological Survey. The results for three samples are included in this report, (Figs. 17, 18 and 19) courtesy of Dr. Kenneth Lajoie of the U.S.G.S. Visually the deposits show a crystalline nature, with structure as small as one micron (10^{-4} cm). Elemental analysis shows great similarities between the three samples. Sulfur is the dominant element in all cases, with major components of silicon and calcium. Chlorine was present in only minor amounts, but most prominantly in the least crystalline sample (Figure 17).

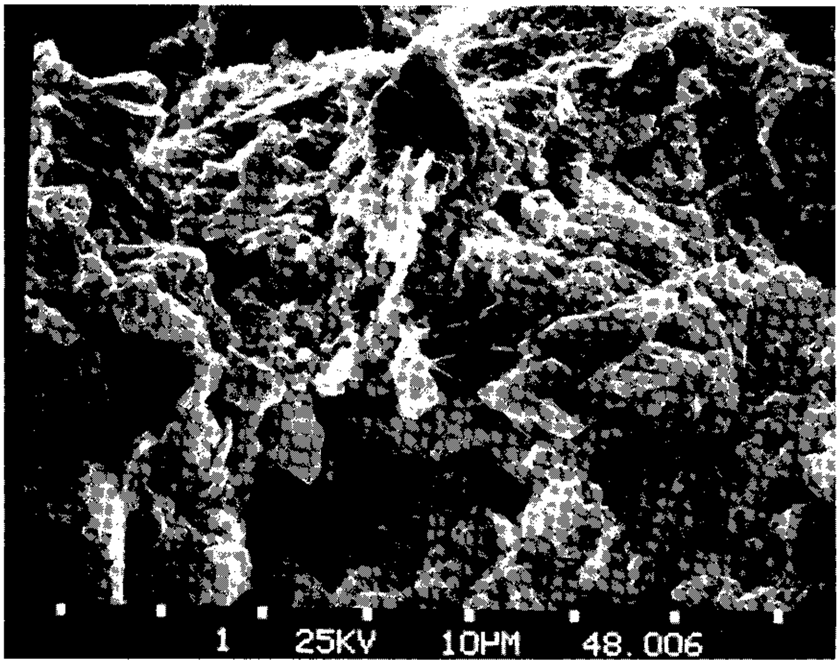
The SEM analyses differ from the "white lake crust" category of Table 8 in that the SEM results show far less sodium and chlorine. The Cl/S ratio was 0.1. The reason for this difference cannot be resolved at this time without more extensive analyses of surface crusts, but it shows the much higher degree of chemical variability we have seen at Mono Lake than at Owens Lake. It also supports the necessity for actually resuspending particles in airstreams in order to match particulate composition seen in the atmosphere.

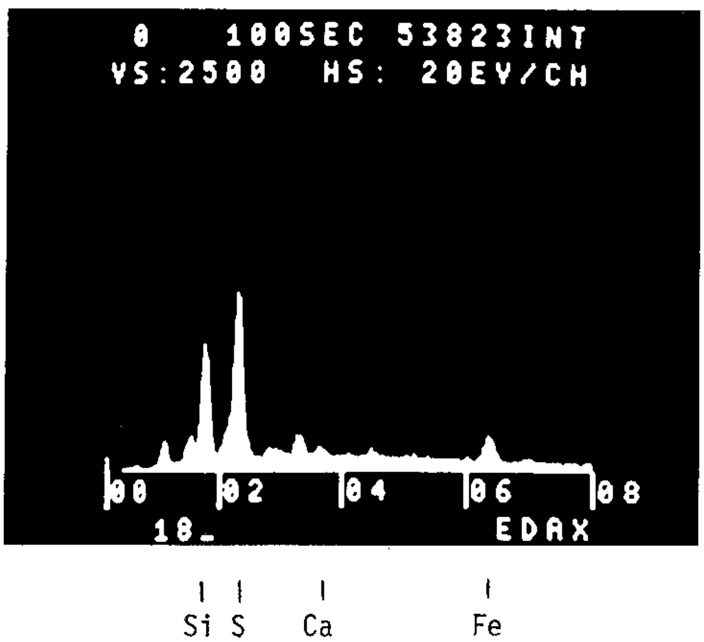
8.3.2 DAILY SAMPLING RESULTS

Daily sampling with the modified multiday sampler, began at Hansen's ranch on May 13, 1980. The unit was moved after 10 weeks to Lee Vining (on July 16) for the remaining 14 weeks of the sampling period, to provide a more representative sample of the likely exposure levels to residents of the city. The results for silicon, iron, sulfur and chlorine are shown in Figures 17, 18, 19 and 20. Evident from the coarse soil data is the rise from mid May to mid June as the ground became more arid. Thereafter, levels remained relatively constant even though mean wind speeds measured at Bishop declined from May to August. Large single day episodes of coarse silicon and iron were well correlated, and increased in magnitude and frequency during the sampling period.

The levels of sulfur and chlorine remained quite low for most of the sampling period. A sulfur episode was seen on July 23, and chlorine episodes were observed on July 6-9, August 19, September 2 and October 12. Levels of these elements increased significantly in mid October, near the end of the sampling period.

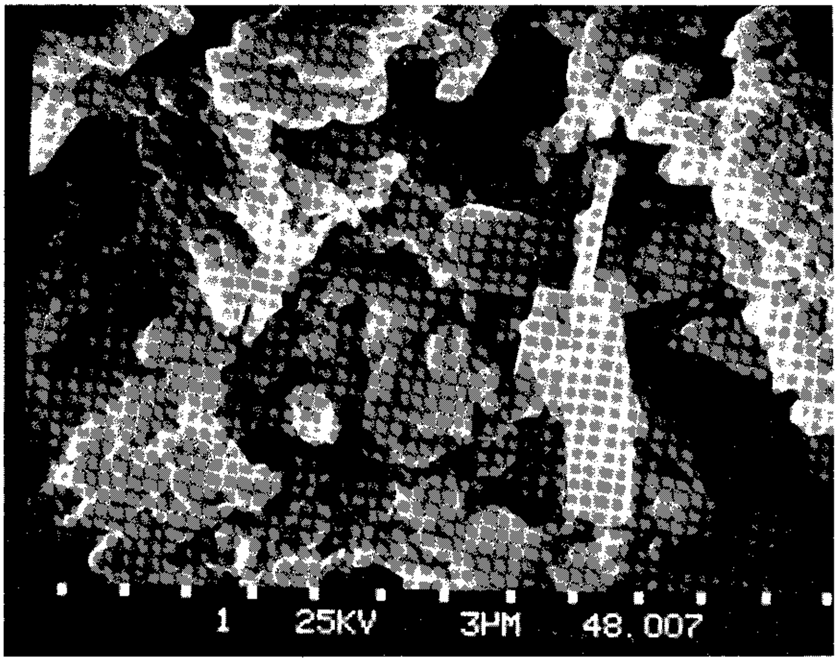
Figure 17

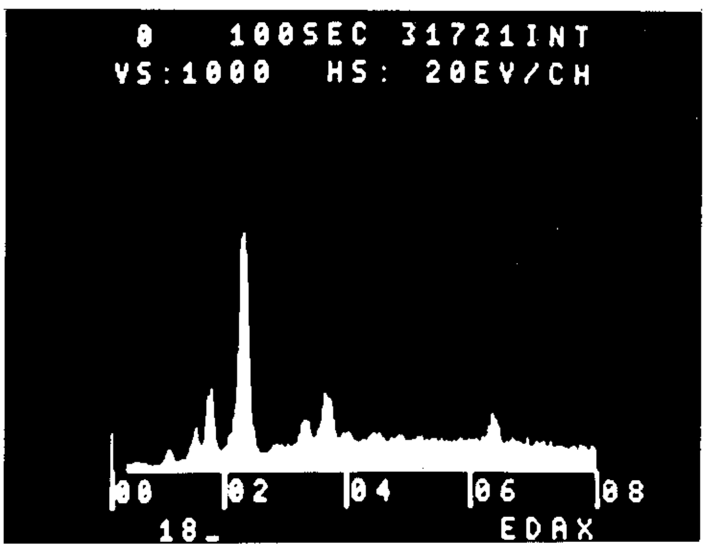




SEM Photograph and ED X-Ray Analysis of Lake Crust 1, USGS

Figure 18

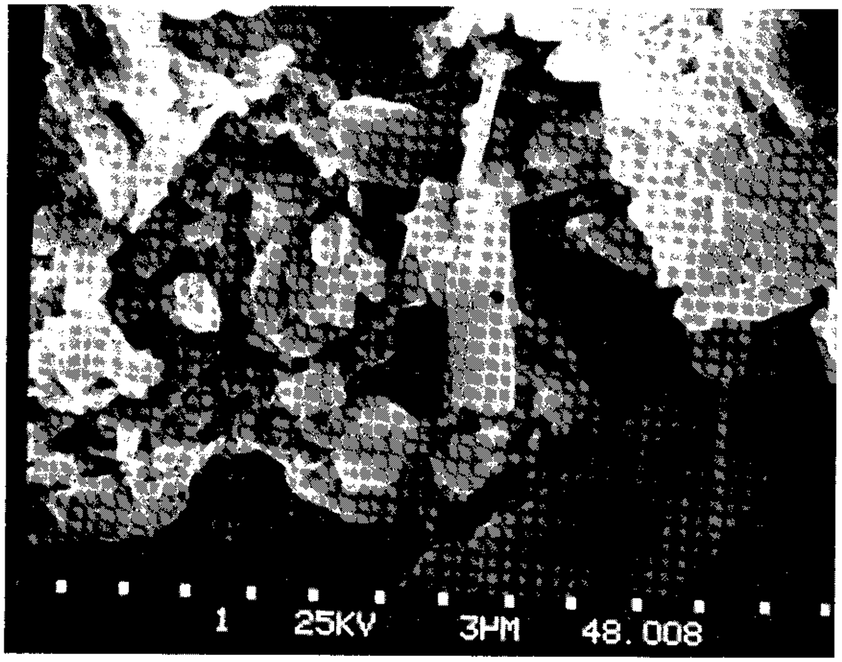


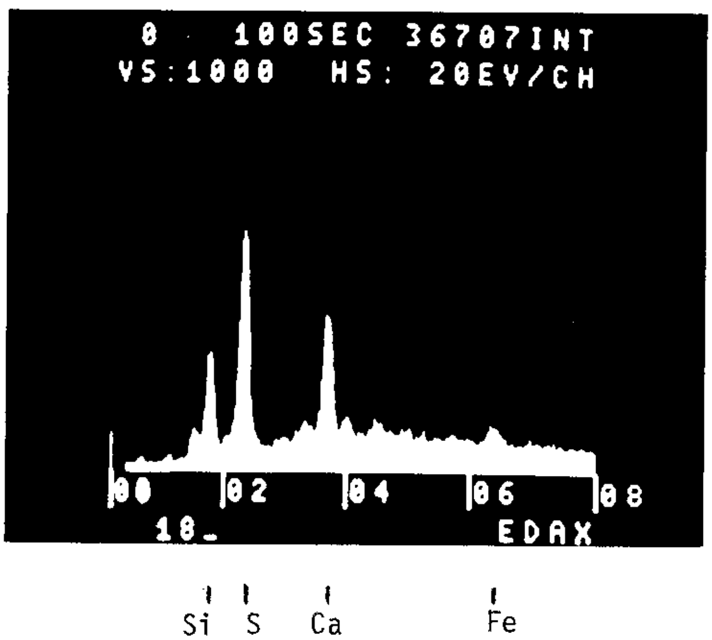


Si S Ca Fe

SEM Photograph and ED X-Ray Analysis of Lake Crust 2, USGS

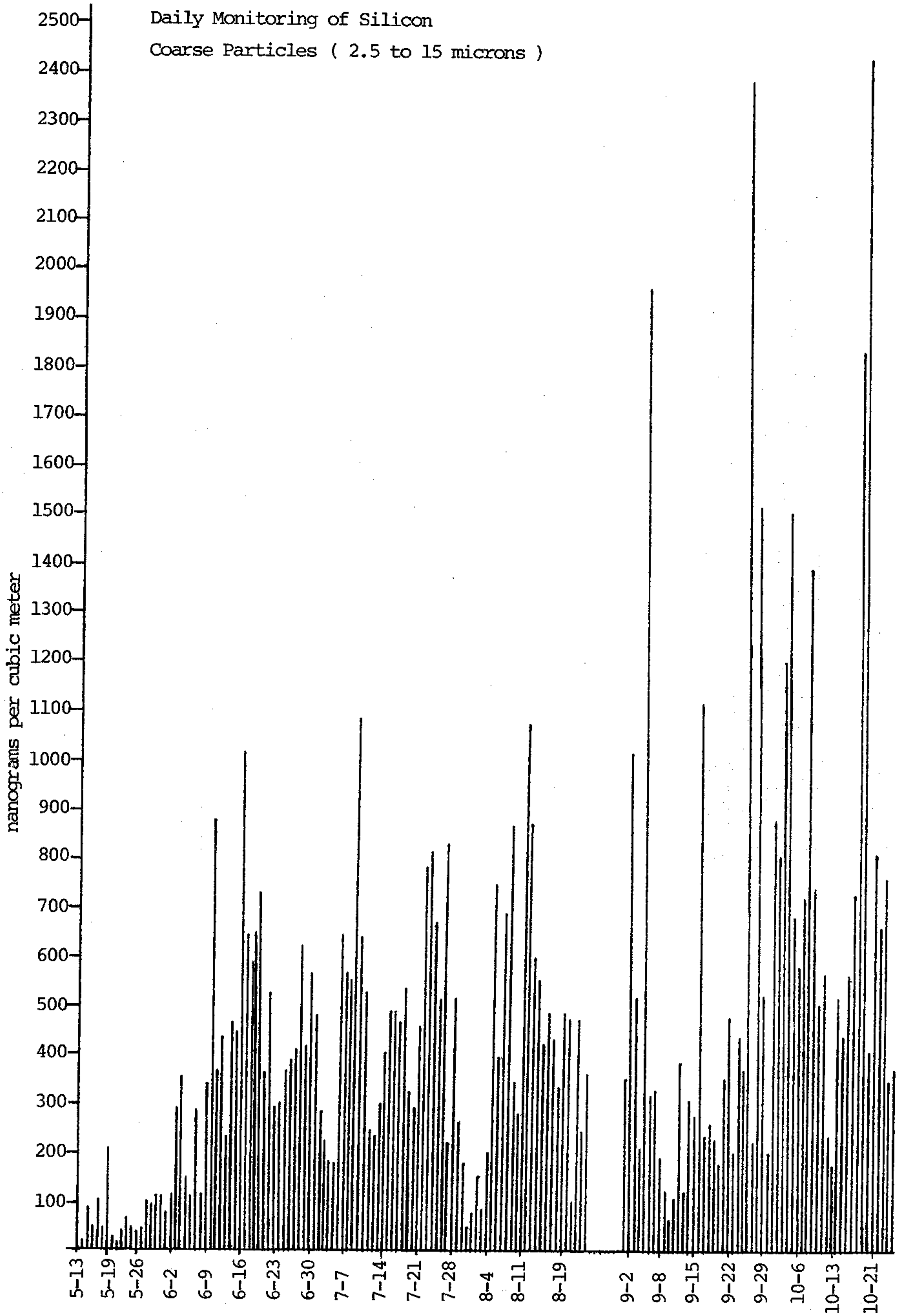
Figure 19





SEM Photograph and ED X-Ray Analysis of Lake Crust 3 , USGS

FIGURE 16



Daily Monitoring of Silicon
Coarse Particles (2.5 to 15 microns)
nanograms per cubic meter
2500
2400
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
5-13
5-19
5-26
6-2
6-9
6-16
6-23
6-30
7-7
7-14
7-21
7-28
8-4
8-11
8-19
9-2
9-8
9-15
9-22
9-29
10-6
10-13
10-21

FIGURE 17

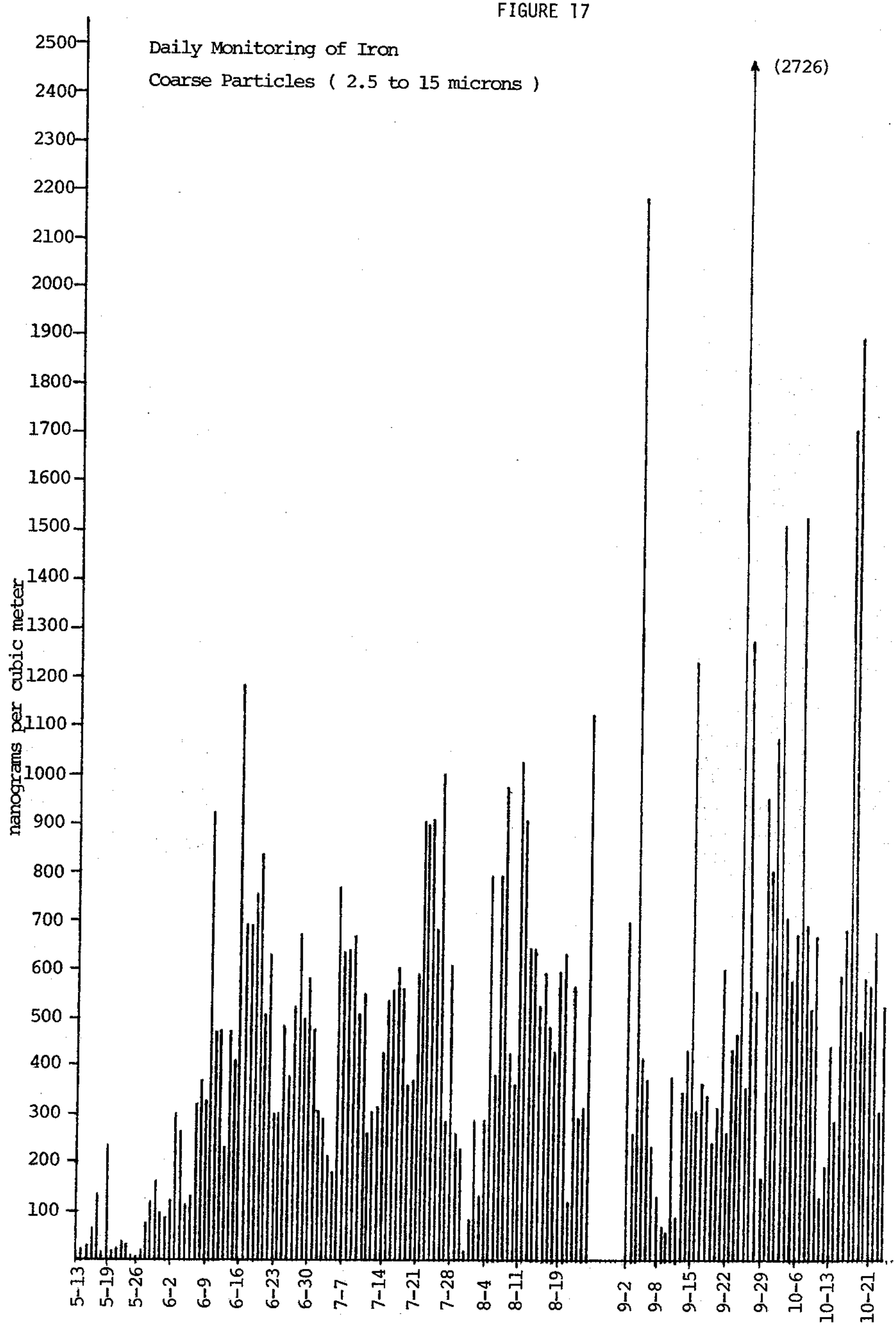

Daily Monitoring of Iron
Coarse Particles (2.5 to 15 microns)
(2726)
nanograms per cubic meter
2500
2400
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
5-13
5-19
5-26
6-2
6-9
6-16
6-23
6-30
7-7
7-14
7-21
7-28
8-4
8-11
8-19
9-2
9-8
9-15
9-22
9-29
10-6
10-13
10-21

FIGURE 18

Daily Monitoring of Sulfur

Coarse Particles (2.5 to 15 microns)

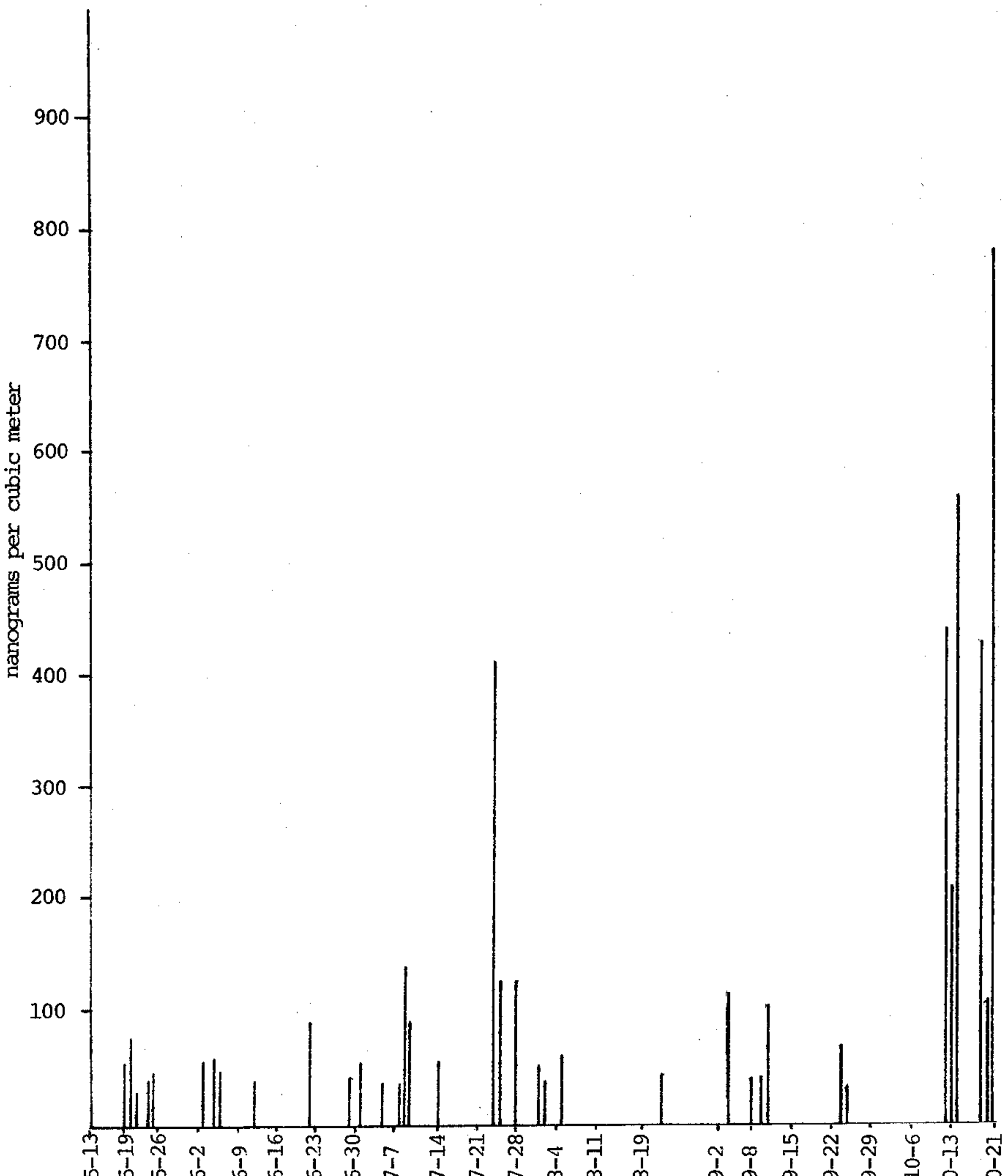
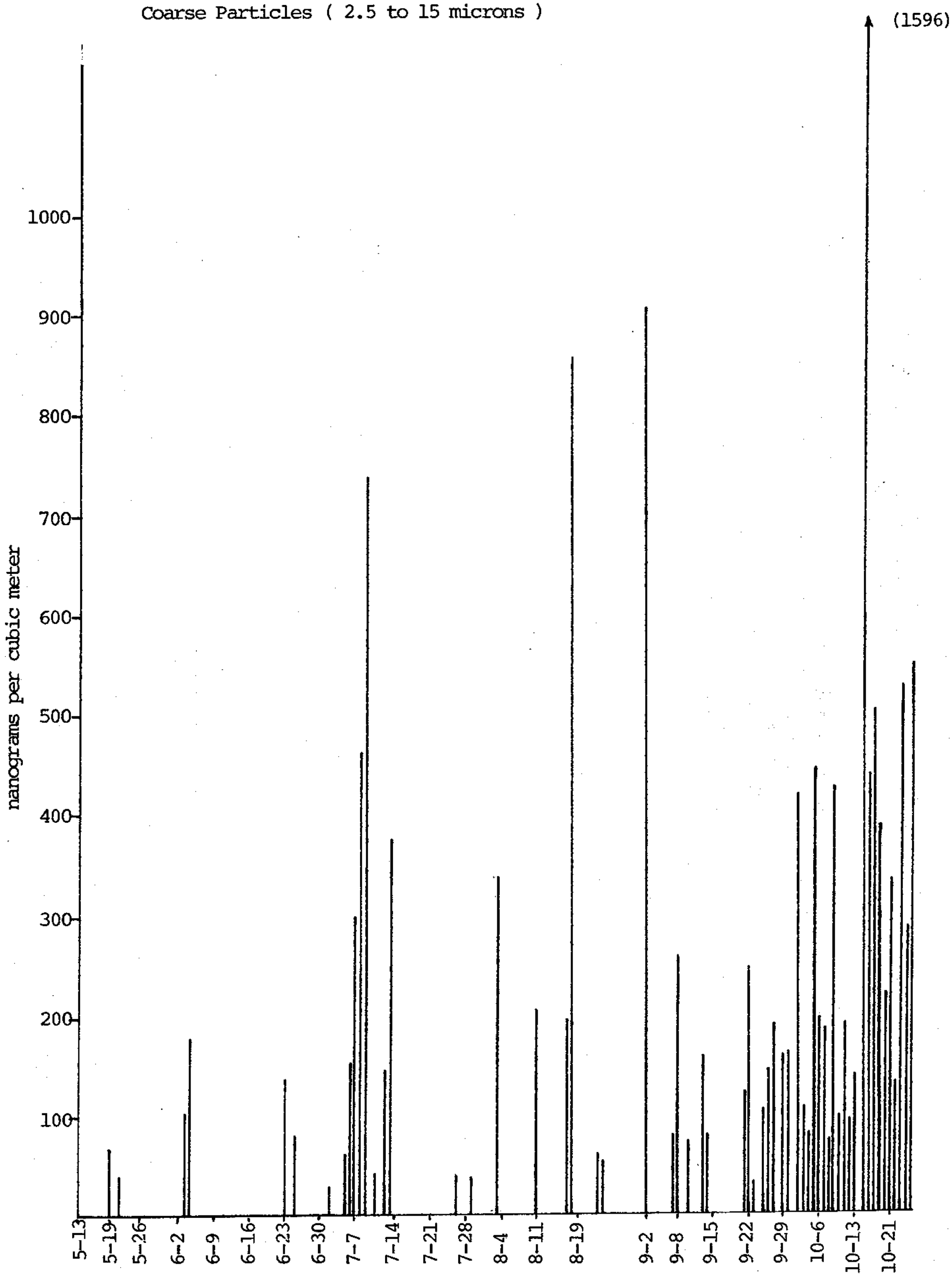


FIGURE 19

Daily Monitoring of Chlorine

Coarse Particles (2.5 to 15 microns)



8.3.3 SOLAR ASSISTED BATTERY POWERED UNIT

Weekly monitoring results taken with the solar assisted battery powered unit are given in Table 9 . Generally the data is consistent with the SFU measured values. The large chlorine episode at Simis on the week of September 1 was seen with the daily sampler at Lee Vining on September 2. The sulfur and chlorine episode at South Tufa for the week of August 20 was concurrent with a large chlorine episode at Hansen's ranch, and elevated sulfur values at Bodie and Benton.

Tables 10 through 14 show the results of the 5 intensive sampling periods when daily samples were taken. Intensive 1 shows slightly elevated soil levels. Intensive 2 at Krakatoa Island shows a drop in aerosol levels as winds died down. Intensive 3 shows a large chlorine peak at Simis on August 19 which may be a part of the episode seen at South Tufa and Hansen's ranch on the week of August 20. By late November blowing dust became significant on occasions, but there was only one sampler left in the area. Concentrations observed were an order of magnitude higher than those seen at any earlier time.

TABLE 9

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

BATTERY POWERED UNIT-WEEKLY MONITORING

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
CEDAR HILL	10/12	2745	309*	4230	231*	221	238	261	442	50*	17	317	48*	43*	63*	121*
SIMIS	8/20	798	233*	1298	174*	131	93	26	106	37*	26	80	36*	32*	49*	93*
SIMIS	8/25	686	130*	1788	97*	55	69*	106	147	21*	13	184	20*	18*	27*	52*
SIMIS	9/1	1495	224*	1794	166*	202	1168	239	349	36*	29*	178	34*	31*	45*	86*
SIMIS	9/8	1420	166*	1737	123*	161	301	138	473	27*	21*	167	26*	23*	33*	62*
SIMIS	9/15	2666	214*	1850	159*	256	309	133	243	34*	27*	124	33*	29*	43*	82*
SIMIS	10/21	479	173*	906	128*	134	85	126	173	28*	21	152	27*	24*	37*	70*
SOUTH TUFA	8/20	1351	329*	1858	245*	69	467	230	299	53*	42*	150	51*	45*	67*	127*
SOUTH TUFA	8/25	1440	189*	2901	140*	106*	225	232	371	30*	19	287	29*	26*	38*	73*
SOUTH TUFA	10/6	334	82*	1213	61*	43	76	88	161	13*	11*	110	13*	11*	17*	28

FINE PARTICLES (LESS THAN 2.5 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
CEDAR HILL	10/12	471*	190*	512	124*	574	83	47	78	18	18	35	34*	30*	52*	97*
SIMIS	8/20	329*	74	149	78	189	33	40*	28*	25*	14	21*	11	21*	37*	70*
SIMIS	8/25	201*	81*	125	53*	240	265	98	22	15*	12*	19	15*	8	22*	41*
SIMIS	9/1	551	117*	81	76*	580	835	436	378	21*	10	18*	21*	18*	31*	44
SIMIS	9/8	194*	78*	144	51*	220	37	24	61	14*	9	12*	14*	12*	21*	40*
SIMIS	9/15	303*	123*	115	81*	245	60*	37*	25*	22*	10	13	22*	20*	20	63*
SIMIS	10/21	270*	109*	193	72*	172	53*	33*	23*	10	17*	17*	20*	10	31*	58*
SOUTH TUFA	8/20	572*	218*	181*	141*	1436	6037	2032	478	39*	26	27	38*	34*	57*	106*
SOUTH TUFA	8/25	263*	106*	392	70*	331	39	30	15	7	16*	21	19*	17*	29*	54*
SOUTH TUFA	10/6	118*	20	170	31*	153	187	105	62	8*	3	28	8*	7*	13*	107

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

TABLE 10

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

BATTERY POWERED UNIT-INTENSIVE 1 ** JULY 15 TO JULY 17,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
LEE VINING	7/15	974	726*	2602	542*	202	388*	154	270	117*	94*	190	113*	64	179*	342*
SOUTH TUFA	7/15	2284*	589*	3669	439*	332*	314*	193	362	95*	76*	346	34	82*	142*	271*
BENDERUP	7/15	3338*	859*	3750	641*	195	458*	224	228	138*	66	144	133*	119*	229*	437*
KRAKATOA ISL.	7/15	2851*	733*	12423	547*	413*	315	1502	1484	118*	44	1502	114*	101*	169*	322*
LEE VINING	7/16	3424*	881*	5453	658*	193	471*	250*	282	142*	76	419	137*	122*	202*	386*
SOUTH TUFA	7/16	3166*	815*	4754	608*	265	435*	176	359	131*	113	194	129	113*	191*	366*
BENDERUP	7/16	3013	778*	5088	378	302	415*	123	327	125*	101*	237	121*	108*	178*	340*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
LEE VINING	7/15	1154*	466*	966	267	366	188	141*	53	85*	71*	72*	84*	28	130*	245*
SOUTH TUFA	7/15	757*	198	259*	103	326	149*	93*	88	57*	47*	29	56*	49*	89*	168*
BENDERUP	7/15	1132*	223	388*	143	230	134	139*	48	33	64	72*	84*	74*	131*	130
KRAKATOA ISL.	7/15	1006*	409*	503	269*	512	73	124*	46	75*	51	25	74*	65*	115*	216*
LEE VINING	7/16	1117*	454*	809	298*	460	80	137*	94*	83*	70*	71*	82*	48	128*	241*
SOUTH TUFA	7/16	1044*	424*	424	331	446	206*	128*	88*	78*	31	66*	40	68*	118*	222*
BENDERUP	7/16	991*	402*	530	265*	432	142	122*	36	74*	62*	63*	73*	64*	111*	210*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

TABLE 11

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

BATTERY POWERED UNIT-KRAKATOA ISLAND ** JULY 15 TO JULY 25,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
KRAKATOA ISLAND	7/15	2851*	733*	12423	547*	413*	315	1502	1484	118*	44	1502	114*	101*	169*	322*
KRAKATOA ISLAND	7/22	8037	3458	4806	581*	373	295	451	1718	125*	100*	443	120*	51	175*	333*
KRAKATOA ISLAND	7/23	5143	772*	5011	576*	270	398	317	486	124*	100*	282	119*	150	177*	339*
KRAKATOA ISLAND	7/24	3583*	921*	3025	688*	167	492*	188	243	149*	120*	217	143*	72	259*	494*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
KRAKATOA ISLAND	7/15	1006*	409*	503	269*	512	73	124*	46	75*	51	25	74*	65*	115*	216*
KRAKATOA ISLAND	7/22	670	418*	690	275*	744	204*	127*	83	77*	64*	40	76*	45	81	237*
KRAKATOA ISLAND	7/23	1349*	319	437	185	757	141	165*	113*	100*	84*	62	99*	87*	154*	290*
KRAKATOA ISLAND	7/24	1059*	427*	602	237	598	258	76	89*	92	66*	66*	78*	68*	129*	243*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

TABLE 12

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

BATTERY POWERED UNIT-INTENSIVE 3 ** AUGUST 18 TO AUGUST 20,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	FE	MN	V	CR	BR	PB
SIMIS	8/18	2526*	648*	3241	482*	313	430	146	205	104*	100	74	100*	89*	145*	277*
SOUTH TUFA	8/18	734	508*	1314	380*	287*	271*	144*	191	82*	112	66*	79*	70*	117*	224*
SOUTH TUFA	8/19	2714*	698*	3033	520*	215	152	197	277	112*	310	104	108*	96*	152*	290*
SIMIS	8/19	6535	757*	872	561*	3103	17158	4437	3764	120*	143	55	115*	102*	151*	288*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	FE	MN	V	CR	BR	PB
SIMIS	8/18	1012*	408*	1248	268*	762	191	40	85*	75*	63*	62*	74*	65*	117*	221*
SOUTH TUFA	8/18	747*	301*	595	192	667	147	91*	62*	55*	23	29	24	48*	88*	166*
SOUTH TUFA	8/19	969*	777	327*	256*	751	350	39	81*	72*	60*	59*	54	62*	113*	213*
SIMIS	8/19	968*	155	322	170	449	75	44	81*	42	60*	60*	71*	62*	112*	211*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

TABLE 13

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

BATTERY POWERED UNIT-INTENSIVE 4 ** OCTOBER 26 TO OCTOBER 28,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	FE	MN	V	CR	BR	PB
SIMIS	10/26	1511	1147	2259	515	411	442	79	155	107*	84*	64	103*	92*	142*	272*
SOUTH TUFA	10/26	7341	986*	3993	734*	579	833	279*	111	158*	124*	127*	136	135*	217*	414*
SIMIS	10/27	1907	588*	2198	439*	375	314*	166*	81	94*	74*	28	91*	81*	131*	250*
SOUTH TUFA	10/27	1432	910*	3330	679*	403	374	257*	330	147*	67	72	127	126*	194*	370*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	FE	MN	V	CR	BR	PB
SIMIS	10/26	975*	379	333*	301	164	72	120*	82*	73*	61*	34	72*	63*	110*	208*
SOUTH TUFA	10/26	1324*	1033	450*	462	402	261*	162*	111*	98*	35	82*	97*	85*	153*	287*
SIMIS	10/27	858*	361	294*	120	182	170*	106*	73*	64*	54*	54*	63*	37	98*	185*
SOUTH TUFA	10/27	1213*	493*	415*	305	410	129	150*	103*	91*	57	31	90*	79*	140*	264*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

TABLE 14

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

BATTERY POWERED UNIT-INTENSIVE-5 ** NOVEMBER 29 TO DECEMBER 1,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
CEDAR HILL	11/29	69083	2169*	52685	1607*	6791	7435	5617	7041	343*	175	6367	330*	294*	423*	807*
SIMIS	11/30	50308	1873*	18926	1390*	5204	2179	1477	2336	134	238*	1369	286*	254*	388*	742*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

		NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
CEDAR HILL	11/29	4007	606	1614	722*	1883	675	229	402	201*	168*	150	198*	174*	305*	574*
SIMIS	11/30	2821*	1139*	1823	749*	2077	939	344*	236*	208*	130	176*	206*	181*	312*	588*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

CONCLUSION

The data collected in the Mono Lake area during this study suggest the following conclusions. During the summer and fall of 1980, ambient aerosol concentrations were usually quite low, with air quality being very good. Weekly averages of particulate concentrations showed an increase in late spring and then remained fairly constant (around 35$\mu g/m^3$) through October. The contribution of the exposed lake bed crusts to the ambient particulate concenttrations was small, being on the order of a few per cent. Several high dust events of a short time scale occurred during the spring and fall, yielding on one occasion size-corrected 24 hour total suspended particulate (TSP) values in excess of 500$\mu g/m^3$ (Simis ranch). Two-thirds of the mass was measured to be inhalable. The beach or playa areas of Mono Lake contributed more to the aerosol concentrations than did the surrounding soils during these events, yielding particulates rich in sodium, sulfur and chlorine.

An earlier ARB study by this group of air quality in the Owens Valley showed the Owens Valley and Mono Lake areas behaved in a similar manner from February through June, 1979. Particulate levels in the Mono Basin were somewhat lower (40-105%) than the average levels in the Owens Valley, but it was noted that the spring dust storms in 1979 showed increases in mass at both Owens Valley and Mono Lake sampling sites. Furthermore, mean wind speeds during the 1980 sampling period were lower than during the 1979 sampling period, resulting in a decrease of ambient aerosol concentrations in 1980 (Figure 9). This indicates that synoptic scale meteorological conditions may have an important influence on measured aerosol concentrations over large distances during some conditions.

Further research is needed in the Mono Lake area. Specifically, the relationship between local meteorology and dust events needs to be better understood. The chemical nature of the particulate aerosol also needs to be compared to the chemistry of the local soils and playas which is seen to be much more variable than the playas of Owens Lake.

ACKNOWLEDGEMENTS

The authors would like to express their appreciation to the many people who assisted in this project. The group would especially like to express thanks to Charles Fryxell, the Great Basin Air Pollution Control District Officer and his employees Don Harjo and Bill Cox for operating the sampling units for the entire 24 week sampling period and for giving special assistance during the intensive sampling periods. We would also like to thank Dean Taylor and David Winkler for their help during the special studies of this project. We express our appreciation to the Hansen's, the Simis', the Benderup's and Mr. Christie for allowing us to station our sampling units on their property. Additional thanks for use of their property goes to the California Department of Transportation, the Lee Vining School District, Bodie National Monument and the Bureau of Land Management. We are grateful to Lowell Ashbaugh and other members of the Air Quality Group at Davis for many useful conversations during preparation of this report. We appreciate the help of Rochelle Uhlenkott and Karen Niiya for doing the Davis roof test of various sampling units. Finally, we would like to thank Betty Lessley, Charles Goodart and Dwight Wohlgemuth for preparation of the manuscript. This material is based on work supported by the California Air Resources Board under Contract No. A9-147-31.

* * * * * * * * * *

APPENDIX

* * * * * * * * * *

MONO LAKE STUDY

Weekly Monitoring

May 13, 1980 to October 28, 1980

* * * * * * * * * * * * *

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

Weekly Monitoring Study

Gravimetric Mass - Micrograms per Cubic Meter
FINE - Particles less than 2.5 Microns

		Bridgeport Bodie	Hansen	Lee Vining	Benton
1.	5/13 - 5/19/80	-	4.3	4.9	3.0
2.	5/19 - 5/26/80	8.9	4.2	5.1	6.1
3.	5/26 - 6/02/80	7.0	7.6	7.1	4.7
4.	6/02 - 6/09/80	5.1	4.1	2.1	4.3
5.	6/09 - 6/16/80	4.4	3.7	3.6	4.4
6.	6/19 - 6/23/80	9.0	5.8	4.8	4.8
7.	6/23 - 6/30/80	5.2	4.2	4.7	4.5
8.	6/30 - 7/07/80	4.4	4.2	4.7	8.1
9.	7/07 - 7/15/80	3.9	6.1	3.7	4.7
10.	7/15 - 7/21/80	-	4.4	4.6	4.5
11.	7/21 - 7/28/80	6.2	8.3	7.5	6.6
12.	7/28 - 8/04/80	6.9	7.4	6.7	6.3
13.	8/05 - 8/11/80	4.2	5.1	5.0	3.8
14.	8/11 - 8/19/80	4.3*	13.9*	7.7	4.8*
15.	8/19 - 8/25/80	4.3*	13.9*	7.3	4.8*
16.	8/25 - 9/01/80	4.2	9.2+	-	3.1
17.	9/02 - 9/08/80	9.0	9.2+	-	7.1
18.	9/08 - 9/15/80	13.7	9.2+	-	3.7
19.	9/15 - 9/22/80	4.2	9.2+	3.4	1.5
20.	9/22 - 9/29/80	4.1	9.2+	5.0	5.0
21.	9/30 - 10/06/80	-	5.0	6.6	5.6
22.	10/07 - 10/13/80	9.1	19.9	8.0	6.2
23.	10/13 - 10/21/80	1.9	2.4	5.6	3.5
24.	10/21 - 10/28/80	6.6	4.8	8.3	4.2

* 2 week sample
\+ 5 week sample

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

Weekly Monitoring Study

Gravimetric Mass - Micrograms per Cubic Meter

COARSE - Particles 2.5 - 15.0 Microns

		Bridgeport Bodie	Hansen	Lee Vining	Benton
1.	5/13 - 5/19/80	-	5.1	4.6	10.3
2.	5/19 - 5/26/80	4.7	7.4	3.0	16.2
3.	5/26 - 6/02/80	8.4	7.5	38.3	18.8
4.	6/02 - 6/09/80	10.9	26.2	71.6	21.6
5.	6/09 - 6/16/80	14.0	30.6	28.7	12.5
6.	6/19 - 6/23/80	25.3	19.5	28.9	32.6
7.	6/23 - 6/30/80	23.1	22.3	22.8	46.5
8.	6/30 - 7/07/80	17.6	14.9	18.9	28.0
9.	7/07 - 7/15/80	18.3	30.5	19.5	62.5
10.	7/15 - 7/21/80	-	19.2	19.6	50.8
11.	7/21 - 7/28/80	40.6	17.0	33.9	40.8
12.	7/28 - 8/04/80	46.7	14.9	19.2	17.9
13.	8/05 - 8/11/80	54.6	14.1	24.6	28.4
14.	8/11 - 8/19/80	47.4*	25.3*	27.5	31.1*
15.	8/19 - 8/25/80	47.4*	25.3*	26.6	31.1*
16.	8/25 - 9/01/80	34.9	18.8+	-	16.2
17.	9/02 - 9/08/80	47.8	18.8+	-	65.4
18.	9/08 - 9/15/80	54.7	18.8+	-	20.3
19.	9/15 - 9/22/80	20.5	18.8+	12.8	20.1
20.	9/22 - 9/29/80	24.0	18.8+	21.1	21.6
21.	9/30 - 10/06/80	-		36.8	16.7
22.	10/07 - 10/13/80	58.8		28.5	21.9
23.	10/13 - 10/21/80	9.2		10.1	11.8
24.	10/21 - 10/28/80	23.5		14.8	26.9

* 2 week sample

\+ 5 week sample

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

Weekly Monitoring Study

Gravimetric Mass - Micrograms per Cubic Meter

TOTAL - Particles Less than 15 Microns

		Bridgeport Bodie	Hansen	Lee Vining	Benton
1.	5/13 - 5/19/80	-	9.3	9.5	13.3
2.	5/19 - 5/26/80	13.6	11.5	8.1	22.3
3.	5/26 - 6/02/80	15.4	15.1	45.4	23.5
4.	6/02 - 6/09/80	15.9	30.3	73.7	25.9
5.	6/09 - 6/16/80	18.4	34.3	32.3	16.9
6.	6/19 - 6/23/80	34.3	25.3	33.7	37.3
7.	6/23 - 6/30/80	28.2	26.5	27.5	51.0
8.	6/30 - 7/07/80	22.0	19.1	23.5	36.1
9.	7/07 - 7/15/80	22.2	36.6	23.2	67.2
10.	7/15 - 7/21/80	-	23.6	24.2	55.3
11.	7/21 - 7/28/80	46.8	25.2	41.4	47.4
12.	7/28 - 8/04/80	53.6	22.3	25.9	24.2
13.	8/05 - 8/11/80	58.8	19.2	29.6	32.3
14.	8/11 - 8/19/80	51.6*	39.2*	35.2	35.9*
15.	8/19 - 8/25/80	51.6*	39.2*	33.9	35.9*
16.	8/25 - 9/01/80	39.0	28.0+	-	19.3
17.	9/02 - 9/08/80	56.8	28.0+	-	72.5
18.	9/08 - 9/15/80	68.4	28.0+	-	24.1
19.	9/15 - 9/22/80	24.6	28.0+	16.1	21.7
20.	9/22 - 9/29/80	28.1	28.0+	26.1	26.6
21.	9/30 - 10/06/80	-	70.8	43.4	22.2
22.	10/07 - 10/13/80	67.9	51.7	36.2	28.1
23.	10/13 - 10/21/80	11.1	8.4	15.7	15.2
24.	10/21 - 10/28/80	30.1	15.2	22.7	31.1

* 2 week sample

\+ 5 week sample

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** MAY 13 TO MAY 19,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1280	57*	4476	37*	79	27*	448	387	37	6	417	8*	7*	12*	23*
LEE VINING	206*	57*	1384	37*	173	16	97	152	8*	7*	146	8*	7*	11*	14
HANSEN RANCH	282*	77*	897	50*	88	258	174	189	11*	9*	110	11*	10*	22*	42*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	87*	31*	456	23*	535	17*	49	62	6*	5*	51	6*	5*	10*	8
LEE VINING	82*	28*	517	21*	481	16*	51	59	6*	5*	71	5*	5*	8*	14
HANSEN RANCH	254*	47*	666	32*	343	23*	49	64	9	5	58	7*	6*	12*	22*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** MAY 19 TO MAY 26,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1957	57*	4176	37*	181	26*	431	452	34	5	373	8*	7*	12*	22*
LEE VINING	1828	62*	4750	40*	197	29*	373	363	46	7	498	9*	8*	13*	24*
BRIDGEPORT	222*	62*	3760	40*	99	29*	315	371	38	5	486	9*	8*	13*	25*
HANSEN RANCH	237*	65*	2694	42*	138	44	243	286	18	8*	262	9*	4	14*	27*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	100*	34*	610	25*	402	19*	74	77	7*	6*	60	7*	6*	12*	25
LEE VINING	2069	56*	1119	29*	629	20*	91	76	5	5*	98	6*	5*	8*	16*
BRIDGEPORT	836	47*	715	28*	513	20*	74	58	7*	5*	65	6*	6*	10*	20*
HANSEN RANCH	263*	53*	714	31*	544	22*	63	59	7*	6*	49	7*	6*	11*	21*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** MAY 26 TO JUNE 2,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	387	44*	2956	29*	84	21*	341	363	27	3	314	6*	6*	9*	17*
LEE VINING	282*	79*	11584	51*	59	37*	946	731	92	18	1267	11*	10*	17*	32*
BRIDGEPORT	216*	60*	2732	39*	137	28*	184	263	18	7*	299	8*	8*	13*	25*
HANSEN RANCH	1050	49*	1449	31*	81	197	153	375	8	6*	172	7*	6*	10*	19*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	414*	75*	1642	42*	1265	29*	120	112	9*	7*	97	8*	7*	14*	27*
LEE VINING	1602	60*	1539	35*	890	23*	77	76	6*	3	97	6*	5*	8*	16*
BRIDGEPORT	1132	41*	810	29*	817	20*	60	51	6*	5*	64	6*	5*	10*	18*
HANSEN RANCH	185*	36*	630	25*	266	18*	39	135	6*	4*	56	5*	5*	9*	18*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** JUNE 2 TO JUNE 9,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1394	58*	4853	37*	187	27*	530	579	37	7	463	8*	7*	12*	17
LEE VINING	2964	89*	16947	57*	62	41*	1548	1138	146	31	2096	13*	11*	20*	37*
BRIDGEPORT	1551	54*	2978	35*	85	25*	242	287	30	7*	343	8*	7*	12*	23*
HANSEN RANCH	1588	54*	4931	35*	60	61	437	426	35	7*	477	8*	7*	12*	16

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	76*	26*	534	19*	400	14*	63	68	5*	4*	61	5*	5*	6*	29
LEE VINING	396*	64*	1221	31*	253	21*	57	33	6*	5*	71	5*	5*	8*	15*
BRIDGEPORT	641	35*	539	22*	460	16*	60	49	5*	4*	59	5*	4*	6*	16*
HANSEN RANCH	211*	45*	832	27*	501	19*	65	68	6*	5*	66	6*	5*	10*	19*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** JUNE 9 TO JUNE 16,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	204*	57*	1352	36*	118	8	146	160	8*	7*	121	8*	7*	12*	23*
LEE VINING	222*	62*	5978	40*	68	29*	533	427	55	10	711	9*	8*	17*	32*
BRIDGEPORT	200*	56*	3534	36*	110	26*	285	336	36	7*	436	8*	7*	12*	22*
HANSEN RANCH	209*	58*	6793	38*	24	27*	605	581	56	12	739	8*	7*	13*	24*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	253*	48*	1036	27*	399	18*	99	120	6*	5*	77	5*	5*	8*	15*
LEE VINING	709*	106*	2492	47*	673	30*	125	114	8*	6*	136	7*	6*	10*	18*
BRIDGEPORT	266*	53*	1022	31*	459	22*	90	88	7*	6*	86	7*	4	11*	21*
HANSEN RANCH	320*	59*	1429	33*	466	23*	121	110	7*	6*	111	7*	3	11*	20*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING ** JUNE 16 TO JUNE 23,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	215*	60*	6339	38*	272	28*	791	887	62	13	679	8*	8*	12*	24*
LEE VINING	258*	72*	8140	46*	126	33*	758	754	84	15	1005	10*	9*	17*	32*
BRIDGEPORT	1313	58*	4012	37*	57	439	379	476	48	6	579	8*	7*	12*	24*
HANSEN RANCH	196*	55*	4766	35*	125	25*	473	616	43	10	594	8*	7*	13*	25*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1503	48*	1032	31*	506	21*	100	127	6*	5*	71	6*	5*	8*	16*
LEE VINING	1006*	147*	3219	62*	1008	38*	192	177	9*	7*	135	8*	7*	11*	21*
BRIDGEPORT	5372	66*	1153	37*	564	675	131	127	8*	6*	131	7*	7*	12*	36
HANSEN RANCH	380*	62*	1755	40*	573	27*	164	186	8*	5	140	8*	7*	13*	25*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING ** JUNE 23 TO JUNE 30,1980

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1856	90*	6871	58*	86	42*	732	626	62	7	614	13*	12*	19*	37*
LEE VINING	395*	110*	7094	71*	35	51*	577	451	45	7	739	16*	14*	27*	51*
BRIDGEPORT	331*	93*	3654	60*	30	43*	292	352	38	6	465	13*	12*	22*	42*
HANSEN RANCH	304*	85*	4654	55*	16	16	447	420	33	12	531	12*	11*	20*	37*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1626	77*	1113	49*	460	33*	105	90	10*	8*	66	9*	8*	15*	28*
LEE VINING	452*	89*	1055	51*	696	36*	85	46	11*	9*	80	11*	10*	16*	29*
BRIDGEPORT	9916	160*	1692	76*	830	49*	137	71	14*	11*	85	13*	11*	19*	36*
HANSEN RANCH	1714	149*	868	80*	411	54*	75	42	17*	13*	56	16*	14*	41*	78*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING ** JUNE 30 TO JULY 7,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1271	90*	5437	58*	46	192	729	801	45	12	504	13*	11*	20*	39*
LEE VINING	350*	98*	3510	63*	48	45*	303	229	43	12*	370	14*	13*	27*	52*
BRIDGEPORT	377*	105*	4362	68*	80	23	361	345	25	13*	518	15*	13*	26*	50*
HANSEN RANCH	3174	104*	4906	67*	82	55	426	413	22	13*	500	15*	13*	23*	44*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	6149	138*	2159	77*	955	50*	201	176	13*	10*	87	12*	11*	19*	37*
LEE VINING	1465	99*	1175	63*	829	43*	56	46	13*	5	61	12*	11*	17*	31*
BRIDGEPORT	530*	102*	1147	58*	677	32	170	45	13*	10*	51	12*	11*	17*	33*
HANSEN RANCH	498*	98*	761	56*	447	39*	75	40	13*	10*	44	12*	11*	27*	51*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING ** JULY 7 TO JULY 14,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	447*	125*	11392	80*	124	58*	1281	920	99	16	1044	18*	16*	27*	52*
LEE VINING	1586	101*	4904	65*	47*	47*	395	286	21	12*	472	14*	13*	20*	38*
BRIDGEPORT	371*	103*	3767	66*	88	46	303	358	24	13*	467	14*	13*	25*	48*
HANSEN RANCH	1891	80*	5720	55*	78	306	645	427	38	7	540	12*	11*	19*	12

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	678*	111*	1075	56*	645	37*	87	53	11*	8*	44	10*	9*	15*	28*
LEE VINING	159*	56*	750	41*	604	31*	69	40	11*	9*	60	11*	10*	16*	30*
BRIDGEPORT	577*	98*	833	51*	605	35*	74	42	10*	8*	48	10*	9*	14*	27*
HANSEN RANCH	5801	137*	1713	68*	676	45*	103	64	13*	10*	65	12*	10*	18*	35*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING ** JULY 14 TO JULY 21,1980

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1257	108*	6553	69*	150	50*	730	691	53	13*	591	15*	14*	23*	45*
LEE VINING	1313	87*	4614	56*	69	40*	379	273	25	11*	499	12*	11*	19*	36*
HANSEN RANCH	1386	94*	4065	61*	52	44*	395	358	35	6	467	13*	12*	20*	39*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	489*	96*	995	55*	594	36*	104	58	12*	10*	40	12*	10*	17*	32*
LEE VINING	131*	46*	466	34*	443	26*	79	33	10*	8*	42	9*	8*	16*	25
HANSEN RANCH	347*	74*	654	44*	584	31*	98	40	10*	8*	46	10*	9*	17*	22

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** JULY 21 TO JULY 28,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	2549	109*	8072	70*	105	51*	848	708	67	10	758	15*	14*	25*	49*
LEE VINING	1998	92*	6061	59*	230	124	580	570	39	9	683	13*	12*	20*	22
HANSEN RANCH	4596	130*	4581	83*	321	154	416	446	26	5	429	18*	16*	26*	49*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	112*	49*	309	30*	614	22*	91	54	8*	7*	49	8*	4	13*	24*
LEE VINING	122*	52*	497	31*	619	23*	114	81	4	7*	69	9*	10	13*	24*
HANSEN RANCH	72	18	365	30*	600	22*	104	66	9*	7*	57	8*	9	13*	29

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** JULY 28 TO AUGUST 4,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	305*	85*	3260	55*	71	32	335	287	29	5	300	12*	11*	19*	37*
LEE VINING	349*	97*	3821	62*	89	49	331	285	36	12*	417	14*	12*	23*	44*
BODIE	569	86*	6733	56*	87	16	796	681	52	13	666	12*	11*	19*	35*
HANSEN RANCH	326*	90*	2439	58*	75	193	261	284	14	11*	298	13*	12*	21*	40*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	130*	56*	299	34*	788	25*	66	51	10*	8*	43	9*	5	14*	27*
LEE VINING	129*	55*	373	33*	887	24*	85	45	9*	8*	51	9*	6	13*	25*
BODIE	102*	44*	543	27*	529	20*	106	59	3	6*	68	7*	6*	11*	20*
HANSEN RANCH	130*	56*	267	34*	888	25*	79	54	10*	8*	44	4	8*	14*	26*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** AUGUST 4 TO AUGUST 11,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	3589	123*	6613	79*	94	24	629	433	58	15*	587	17*	16*	28*	53*
LEE VINING	120	100*	2756	64*	47*	46*	466	329	46	8	618	14*	13*	22*	16
BODIE	489*	135*	13677	87*	233	36	1415	1039	86	24	1166	19*	17*	26*	50*
HANSEN RANCH	338*	94*	2454	61*	57	43	225	208	23	12*	254	13*	12*	23*	43*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	139*	61*	331	37*	349	28*	54	40	11*	9*	45	10*	9*	16*	30*
LEE VINING	99*	43*	261	26*	225	20*	56	38	8*	6*	46	3	6*	11*	30
BODIE	122*	52*	877	32*	168	23*	131	81	5	7*	101	9*	4	14*	26*
HANSEN RANCH	130*	57*	225	35*	352	26*	52	45	10*	8*	36	4	8*	14*	43

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** AUGUST 11 TO AUGUST 19,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON†	300*	83*	7810	53*	327	38*	814	623	77	12	846	12*	11*	18*	35
LEE VINING	297*	83*	6277	53*	123	38*	520	420	61	8	726	12*	11*	17*	33*
BODIE†	2014	91*	11609	58*	296	42*	1358	1036	105	25	1379	13*	12*	21*	40*
HANSEN RANCH †	260*	71*	6481	45*	103	563	655	958	48	7	776	10*	9*	15*	29*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON†	73*	32*	230	19*	434	8	56	34	2	4*	38	5*	4*	8*	16*
LEE VINING	108*	47*	338	28*	529	21*	73	44	8*	7*	55	4	7*	13	40
BODIE†	69*	30*	320	18*	320	13*	70	32	5*	4*	45	5*	3	8*	15
HANSEN RANCH†	1030	47*	292	27*	385	1715	372	1353	7*	6*	54	7*	6*	12*	22*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

† TWO WEEK SAMPLE

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** AUGUST 19 TO AUGUST 25,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON †	300*	83*	7810	53*	327	38*	814	623	77	12	846	12*	11*	16*	35
LEE VINING	3403	119*	7075	76*	162	57	571	518	57	8	709	17*	15*	24*	47*
BODIE†	2014	91*	11609	58*	296	42*	1358	1036	105	25	1379	13*	12*	21*	40*
HANSEN RANCH †	260*	71*	6481	45*	103	563	655	958	48	7	776	10*	9*	15*	29*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON†	73*	32*	230	19*	434	8	56	34	2	4*	38	5*	4*	8*	16*
LEE VINING	131*	57*	416	34*	700	25*	92	53	10*	8*	66	6	9	15*	28*
BODIE†	69*	30*	320	18*	320	13*	70	32	5*	4*	45	5*	3	6*	15
HANSEN RANCH †	1030	47*	292	27*	385	1715	372	1353	7*	6*	54	7*	6*	12*	22*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

† TWO WEEK SAMPLE

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** AUGUST 25 TO SEPTEMBER 2,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	1525	95*	5808	61*	25	44*	574	458	60	8	657	13*	12*	23*	43*
BODIE	411*	114*	7525	74*	69	21	766	570	62	11	735	16*	15*	31*	59*
HANSEN RANCH †	111*	31*	4416	20*	22	36	444	447	40	7	632	4*	4*	7*	13*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	139*	60*	481	36*	622	27*	91	67	10*	8*	76	10*	5	17	33*
BODIE	198*	94	494	28*	282	21*	88	45	4	6*	67	8*	7*	12	24*
HANSEN RANCH †	54	16*	193	10*	125	348	91	438	3*	2*	38	3*	2*	6*	11*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

† FIVE WEEK SAMPLE

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** SEPTEMBER 2 TO SEPTEMBER 8,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COAR$E PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	4678	178*	13036	115*	47	169	1347	1055	108	24	1345	25*	23*	42*	81*
BODIE	497*	137*	11829	88*	299	92	1241	1004	111	22	1318	19*	17*	31*	60*
HANSEN RANCH†	111*	31*	4416	20*	22	36	444	447	40	7	632	4*	4*	7*	13*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	188*	81*	610	49*	665	56*	99	66	14*	11*	80	10	11*	20	39*
BODIE	156*	67*	506	41*	673	30*	115	61	12*	9*	77	4	10*	13	33*
HANSEN RANCH†	54	18*	193	10*	125	348	91	438	3*	2*	38	3*	2*	6*	11*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

+ FIVE WEEK SAMPLE

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** SEPTEMBER 8 TO SEPTEMBER 15,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COAR$E PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	2187	89*	5506	57*	34	33	580	414	53	16	549	13*	11*	24*	46*
BODIE	5183	181*	15157	116*	183	116	1510	1294	137	17	1541	25*	23*	44*	76
HANSEN RANCH †	111*	31*	4416	20*	22	36	444	447	40	7	632	4*	4*	7*	13*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	69*	30*	226	18*	249	14*	39	39	4	4*	34	5*	4*	9*	27
BODIE	179*	268	1289	44*	1007	32*	218	150	12*	10*	178	7	10*	18*	33*
HANSEN RANCH †	54	18*	193	10*	125	348	91	438	3*	2*	38	3*	2*	6*	11*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

† FIVE WEEK SAMPLE

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** SEPTEMBER 15 TO SEPTEMBER 22,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	365*	102*	2045	66*	28	48*	221	169	21	6	191	15*	13*	23*	43*
LEE VINING	196	97*	2502	62*	45*	19	233	223	14*	5	282	14*	12*	20*	25
BODIE	465*	2669	6524	82*	141	23	694	369	60	12	647	18*	16*	35*	66*
HANSEN RANCH +	111*	31*	4416	20*	22	36	444	447	40	7	632	4*	4*	7*	13*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	182*	81*	116	49*	172	37*	44	23	14*	11*	11*	6	12*	22*	42*
LEE VINING	140*	62*	174	38*	308	28*	56	32	11*	9*	28	4	9	16*	53
BODIE	134*	102	628	35*	338	26*	92	45	10*	8*	79	10*	8*	15*	29*
HANSEN RANCH +	54	18*	193	10*	125	348	91	438	3*	2*	38	5*	2*	6*	11*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

+ FIVE WEEK SAMPLE

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** SEPTEMBER 22 TO SEPTEMBER 29,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	345*	96*	4286	62*	113	26	434	375	35	12*	431	13*	12*	22*	42*
LEE VINING	364*	101*	5741	65*	149	20	476	449	48	12*	611	14*	10	21*	38
BODIE	851	90*	5147	58*	54	42*	530	369	48	11	528	13*	12*	21*	41*
HANSEN RANCH †	111*	31*	4416	20*	22	36	444	447	40	7	632	4*	4*	7*	13*

FINE PARTICLES (LESS THAN 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	87*	38*	162	23*	241	17*	53	40	3	5*	32	7*	9	11*	22
LEE VINING	105*	46*	211	28*	224	21*	63	38	8*	6*	35	3	10	12*	22*
BODIE	107*	47*	446	28*	185	21*	154	63	3	7*	64	8*	7*	13*	25*
HANSEN RANCH †	54	18*	193	10*	125	348	91	438	3*	2*	38	3*	2*	6*	11*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

† FIVE WEEK SAMPLE

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** SEPTEMBER 29 TO OCTOBER 6,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	382*	976	2452	68*	48*	33	331	265	33	12	336	16*	13*	28*	53*
LEE VINING	493*	2284	9149	88*	62*	62*	894	732	72	17*	1125	20*	17*	31*	59*
BODIE	262*	88*	173	47*	33*	44	55	40	11*	9*	31	11*	9*	17*	33*
HANSEN RANCH†	548*	4036	13611	98*	69*	41	1637	1794	109	36	1796	22*	19*	34	67*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	157*	171	349	42*	262	31*	99	63	12*	10*	47	12*	14	19*	35*
LEE VINING	160*	70*	467	42*	246	31*	91	64	12*	10*	61	6	10	19*	35*
BODIE	103*	46*	35	28*	19	22	13*	9*	8*	7*	6*	8	7*	12*	23*
HANSEN RANCH	116*	51*	433	31*	132	23*	96	84	9*	7*	64	5	8	13*	25*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** OCTOBER 6 TO OCTOBER 13,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	291*	681	3094	52*	41	36*	340	300	27	10*	362	12*	10*	19*	37*
LEE VINING	328*	885	3707	58*	175	41*	394	362	34	11*	504	13*	11*	22	42*
BODIE	448*	4115	12165	80*	124	56*	1452	999	114	25	1472	18*	15*	27	58*
HANSEN RANCH	393*	132*	5464	70*	27	90	805	949	66	16	902	16*	14*	23	53*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	128*	56*	274	34*	352	25*	65	39	10*	8*	42	5	8*	16*	30
LEE VINING	86*	38*	157	23*	100	17*	43	29	7*	5*	26	3	5*	11*	32
BODIE	123*	53*	827	32*	284	24*	138	68	9*	7*	104	4	8*	13*	24*
HANSEN RANCH	132*	724	1808	32*	290	23*	286	289	17	3	272	9*	7*	13*	45

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** OCTOBER 13 TO OCTOBER 21,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	252*	84*	2161	45*	32*	18	249	177	21	8*	218	10*	11	13	33*
LEE VINING	379*	127*	1594	68*	48*	29	150	185	19	10	203	15*	13*	27*	92
BODIE	227*	76*	1232	40*	29*	176	168	232	9	8*	131	9*	8*	16*	31*
HANSEN RANCH	337*	113*	958	60*	25	28	111	125	14*	11*	106	14*	12*	24*	45*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	83*	37*	172	22*	208	16*	42	35	3	5*	30	6*	8	9*	17*
LEE VINING	123*	54*	102	33*	202	25*	53	27	10*	8*	25	5	8*	14*	26*
BODIE	98*	43*	162	26*	197	20*	44	31	8*	6*	19	3	6*	11*	20*
HANSEN RANCH	95*	42*	91	26*	152	19*	29	20	7*	6*	14	3	9	8	22*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE MONITORING STUDY ** OCTOBER 21 TO OCTOBER 28,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	315*	1213	4537	56*	40*	39*	510	324	38	11*	452	13*	11*	16	41*
LEE VINING	290*	97*	2311	52*	37*	36	229	237	23	10*	300	12*	10*	21	26
BODIE	560*	1888	6321	100*	71*	70*	667	398	45	11	571	23*	19*	37*	48
HANSEN RANCH	563*	188*	2553	100*	37	102	276	324	26	19*	323	23*	19*	35*	67*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
BENTON	123*	54*	467	33*	222	24*	86	59	9*	8*	51	4	8*	13*	25*
LEE VINING	123*	54*	227	33*	272	25*	89	50	9*	8*	55	6	8*	13*	25*
BODIE	206*	90*	691	55*	255	41*	131	66	16*	13*	82	7	13*	15	42*
HANSEN RANCH	246*	109*	300	66*	327	49*	72	61	19*	15*	33	9	20	13	51*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

MONO LAKE STUDY

Daily Monitoring

May 13, 1980 to October 28, 1980

* * * * * * * * * * * * * *

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** MAY 13 TO MAY 19,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	2390*	798	3566	375*	267*	270*	379	460	90*	72*	350	88*	78*	111	210*
DAY 2	758*	208*	179	119*	85*	86*	38	82	29*	11	23	28*	27	30	38
DAY 3	1458	489	872	188*	134*	135*	102	100	45*	31	38	44*	39*	57*	108*
DAY 4	832*	228*	494	130*	93*	94*	59	130	31*	25*	72	31*	27*	40*	72
DAY 5	975	759	1020	180*	128*	130*	114	193	43*	35*	145	42*	37*	45	102*
DAY 6	1052*	288*	425	164*	62	118*	73	79	39*	32*	31*	38*	34*	45	95*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	2843	330*	820	216*	510	163*	84	106	64*	51*	53	63*	55*	93*	175*
DAY 2	362*	132*	527	87*	56	66*	50	19	26*	21*	21*	26*	14	36*	68*
DAY 3	2544	881	285	95	256	666	202	112	38*	31*	23	38*	33*	53*	100*
DAY 4	450	271	1216	95*	221	72*	38	56	28*	23*	37	28*	24*	44*	48
DAY 5	711	501	641	113*	256	85*	40	31	33*	27*	37	33*	29*	55*	104*
DAY 6	1495*	545*	451*	358*	289*	273*	178*	122*	107*	87*	87*	107*	92*	432*	814*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** MAY 19 TO MAY 26,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1040	603	2082	159*	80	70	205	245	38*	13	239	37*	33*	29	94*
DAY 2	397	248*	232	57	32	102*	58*	19	34*	21	27*	33*	24	27	84*
DAY 3	728*	200*	116	114*	81*	41	60	54	19	19	32	27*	24*	37*	70*
DAY 4	509	229	362	144*	42	103*	45	60	35*	28*	48	34*	30*	42	89*
DAY 5	429	289*	660	165*	49	119*	67	87	40*	32*	35	39*	34*	49*	94*
DAY 6	849	275*	487	157*	112*	115*	64*	54	38*	11	30*	37*	32*	31	91*
DAY 7	939*	423	372	115	104*	106*	38	44	35*	26	28*	34*	30*	46*	33
DAY 8	859*	131	446	135*	96*	97*	90	62	32*	20	29	32*	28*	44*	85*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	764	158*	678	103*	394	78*	35	33	31*	25*	39	31*	26*	64*	121*
DAY 2	602	301	270	91*	84	69*	45*	31*	27*	22*	22*	27*	23*	38*	72*
DAY 3	330*	120*	562	79*	123	60*	39*	27*	23*	19*	19*	23*	20*	35*	66*
DAY 4	442*	159*	693	104*	133	79*	20	35*	31*	25*	25*	31*	12	45*	65*
DAY 5	362*	130*	478	85*	147	65*	25	29*	25*	20*	20*	25*	22*	38*	72*
DAY 6	430*	156*	129*	102*	112	78*	51*	23	30*	24*	24*	30*	26*	44*	84*
DAY 7	527*	168*	389	124*	234	94*	61*	42*	36*	29*	29*	36*	31*	52*	97*
DAY 8	368*	446	110*	87*	129	66*	43*	29*	26*	10	21*	26*	17	40*	75*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** MAY 26 TO JUNE 2,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1003*	275*	977	157*	112*	113*	74	126	38*	30*	76	37*	32*	51*	98*
DAY 2	446	299	918	146*	103*	105*	91	163	35*	28*	125	34*	30*	27	90*
DAY 3	811*	191	1119	127*	90*	91*	92	166	19	12	164	30*	26*	26	78*
DAY 4	893*	354	1106	140*	100*	101*	95	155	34*	27*	102	33*	16	19	68*
DAY 5	773*	151	723	121*	86*	87*	75	139	29*	9	91	28*	25*	38	77*
DAY 6	1068*	366	1047	168*	119*	120*	82	162	17	32*	129	39*	35*	28	101*
DAY 7	484	479	2850	126*	58	53	286	324	17	24*	301	29*	26*	38	6[illegible]

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	401*	143*	753	94*	289	71*	25	28	28*	22*	14	27*	24*	41*	7[illegible]
DAY 2	398	152*	2136	99*	448	75*	45	37	29*	23*	19	29*	25*	42*	80
DAY 3	168	119*	208	78*	405	59*	45	15	23*	7	23	23*	20*	36*	67*
DAY 4	378*	499	434	88*	567	67*	39	45	26*	21*	27	26*	22*	36*	6
DAY 5	302*	60	310	72*	573	55*	48	44	21*	17*	49	21*	11	30*	56
DAY 6	393*	114	264	30	434	71*	51	36	28*	22*	39	27*	11	42*	70
DAY 7	512*	317	825	118*	894	89*	61	100	16	28*	78	34*	29*	49*	92*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** JUN3 TO JUNE 10,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	557	532	3532	115*	82*	104	406	301	26	22*	268	27*	24*	39*	74*
DAY 2	1357	515	1483	141*	61	181	136	143	34*	11	116	33*	29*	31	93*
DAY 3	817*	224*	1096	128*	49	92*	165	146	26	18	129	30*	18	44*	83*
DAY 4	885*	755	2847	139*	99*	100*	263	278	33*	27*	319	33*	29*	46*	88*
DAY 5	766*	210*	1089	120*	85*	86*	260	321	29*	23*	371	28*	27	19	70*
DAY 6	1064*	583	3411	167*	119*	120*	243	347	21	18	334	39*	35*	49*	55
DAY 7	1223*	1771	8769	192*	136*	138*	728	791	41	37*	915	45*	40*	56*	107*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	592	117*	941	77*	330	58*	64	73	22*	18*	54	22*	19*	31*	58*
DAY 2	342*	125*	384	82*	306	62*	21	25	24*	9	20*	24*	10	35*	66*
DAY 3	460*	616	734	112*	550	85*	33	48	33*	26*	28	33*	28*	51*	96*
DAY 4	515*	184*	775	121*	562	91*	76	64	35*	26*	60	35*	30*	48*	91*
DAY 5	366*	414	809	90*	389	68*	92	116	26*	21*	80	26*	23*	38*	71*
DAY 6	240	258	667	84*	245	64*	73	96	25*	20*	76	25*	21*	36*	72*
DAY 7	1227	1043	1163	117*	257	83	157	221	34*	27*	165	34*	29*	47*	89*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** JUNE 10 TO JUNE 16,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	650*	704	3642	102*	73*	74*	378	429	55	16	467	24*	36	31*	58*
DAY 2	1029	878	4358	139*	44	100*	385	416	33*	27*	466	33*	29*	41*	78*
DAY 3	667	588	2271	134*	95*	96*	192	196	16	26*	231	31*	28*	33	35
DAY 4	852*	1018	4599	134*	95*	96*	382	403	32*	11	467	31*	28*	40*	77*
DAY 5	1074*	997	4422	168*	120*	121*	320	502	40*	15	412	39*	35*	37	96*
DAY 6	809*	2176	10012	127*	90*	91*	917	867	51	23	1179	30*	26*	25	72*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	333*	324	745	79*	192	60*	70	93	23*	19*	105	23*	20*	33*	62*
DAY 2	118	117*	437	27	247	58*	83	62	11	18*	60	23*	20*	33*	62*
DAY 3	525	549	272	89*	259	67*	52	40	26*	8	33	26*	22*	36*	68*
DAY 4	925	153*	1620	100*	254	76*	71	48	29*	24*	72	29*	25*	42*	79*
DAY 5	443	113	661	89*	295	67*	46	59	26*	8	35	26*	22*	38*	71*
DAY 6	341*	346	971	80*	246	61*	147	114	24*	9	120	24*	13	34*	65*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** JUNE 16 TO JUNE 24,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1569	2416	6441	177*	125*	127*	571	624	47	34*	682	41*	36*	18	111*
DAY 2	971*	1920	5812	152*	108*	109*	534	727	39	17	688	36*	31*	46	99*
DAY 3	564	1912	6547	150*	106*	108*	708	912	94	36	760	35*	31*	57*	109*
DAY 4	1029*	2749	7321	160*	114*	115*	695	800	49	19	832	38*	33*	29	108*
DAY 5	887*	1214	3601	139*	99*	100*	343	501	33*	15	500	33*	29*	30	94*
DAY 6	1128*	1828	5242	175*	94	126*	453	645	42*	19	633	41*	36*	58*	110*
DAY 7	928*	684	2846	145*	103*	104*	217	334	35*	12	298	34*	30*	47*	90*
DAY 8	851	1062	2951	204*	145*	136	279	311	49*	39*	298	48*	42*	29	130*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	470*	170*	1077	111*	334	85*	51	94	33*	11	76	33*	28*	61*	115*
DAY 2	457*	696	1280	106*	413	80*	126	159	31*	25*	136	31*	27*	46*	87*
DAY 3	769	619	976	100*	410	76*	166	198	29*	24*	148	29*	25*	46*	87*
DAY 4	1456	881	1904	108*	496	81*	193	250	31*	25*	217	31*	18	45*	39
DAY 5	405*	433	1274	94*	697	71*	161	172	28*	22*	142	28*	24*	39*	74*
DAY 6	331	426	868	79*	584	60*	128	135	23*	19*	126	23*	20*	34*	63*
DAY 7	388*	139*	1095	91*	277	69*	39	70	27*	22*	52	27*	23*	38*	71*
DAY 8	492*	816	346	116*	201	88*	31	53	34*	28*	21	34*	29*	48*	91*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** JUNE 24 TO JULY 1,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	819*	1106	3686	126*	91*	92*	377	395	42	26	479	30*	27*	46*	40
DAY 2	1626	1096	3839	174*	124*	80	374	375	42*	34*	384	41*	36*	38	113*
DAY 3	2286*	641	4040	358*	255*	258*	564	541	86*	45	521	84*	74*	59	257*
DAY 4	903*	1741	6159	141*	101*	102*	635	516	60	23	672	33*	29*	22	98*
DAY 5	1025*	1551	4044	159*	44	114*	418	469	46	21	487	37*	33*	54*	102*
DAY 6	1233*	1984	5649	192*	137*	138*	513	494	46*	37*	585	45*	40*	34	117*
DAY 7	494	1265	4760	186*	58	134*	454	485	26	14	475	44*	38*	30	117*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	457*	163*	591	56	299	81*	62	65	31*	25*	40	31*	41	41*	77*
DAY 2	478*	882	420	112*	281	85*	49	71	33*	27*	46	33*	27	47*	88*
DAY 3	968	742	475	259*	237	196*	91	54	36	62*	39	76*	56	116*	218*
DAY 4	663	477	686	96*	179	72*	66	65	28*	8	102	28*	21	41*	78*
DAY 5	462*	161*	2754	105*	556	80*	96	97	31*	25*	81	30*	26	42*	80*
DAY 6	423*	152*	815	99*	521	75*	90	77	29*	24*	44	29*	13	41*	77*
DAY 7	516*	187*	890	123*	387	29	62	16	36*	29*	30	36*	12	50*	95*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** JULY 1 TO JULY 8,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	520	753	2774	137*	97*	98*	290	396	17	26*	302	32*	28*	47*	89*
DAY 2	853*	404	2234	134*	95*	29	294	303	32*	10	288	31*	28*	24	86*
DAY 3	840*	304	1765	132*	94*	95*	209	216	32*	25*	217	31*	27*	43*	82*
DAY 4	936*	386	1589	147*	38	106*	157	192	35*	19	177	34*	30*	48*	91*
DAY 5	963*	1625	6414	150*	107*	64	629	666	67	29*	769	35*	31*	48*	92*
DAY 6	1549	1726	5592	170*	121*	152	544	514	52	20	637	40*	35*	54*	44
DAY 7	1157	1421	5486	145*	41	298	595	516	37	28*	634	34*	30*	50*	95*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	474*	169*	630	111*	644	84*	56	61	32*	9	29	32*	18	44*	63*
DAY 2	724	288	327	94*	495	71*	80	55	28*	22*	29	28*	31	40*	58
DAY 3	455*	600	538	107*	517	81*	45	33	31*	25*	21	31*	27*	44*	62*
DAY 4	526*	188*	1056	123*	507	93*	76	55	36*	29*	37	36*	14	49*	66
DAY 5	383*	504	1114	89*	321	68*	102	67	26*	21*	84	26*	23*	36*	62
DAY 6	269	132*	449	87*	255	66*	64	49	26*	7	44	26*	12	36*	68*
DAY 7	617*	218*	1639	143*	617	108*	106	132	42*	18	104	41*	36*	58*	110*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-HANSEN RANCH ** JULY 8 TO JULY 15,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	932*	2360	10800	144*	146	467	1189	717	45	20	664	34*	12	19	92*
DAY 2	3163	1326	6395	163*	95	738	682	469	39*	31*	500	38*	33*	51*	98*
DAY 3	871*	1225	5234	137*	97*	98*	592	411	43	14	549	32*	29	45*	85*
DAY 4	707*	375	2459	111*	79*	42	303	214	27*	22*	259	26*	24	25	73*
DAY 5	764*	489	2373	120*	85*	86*	235	254	17	11	295	28*	25*	19	69*
DAY 6	887*	568	3023	139*	99*	143	355	283	34*	16	313	33*	20	46*	87*
DAY 7	1105*	853	4078	173*	60	378	510	371	25	34*	432	41*	36*	42	50
DAY 8	495	1534	4850	162*	115*	116*	427	325	45	31*	534	38*	33*	55*	105*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1167	638	1109	98*	289	74*	141	66	29*	23*	79	29*	25*	45*	84*
DAY 2	672	266	462	97*	160	73	58	38	29*	23*	35	29*	25*	44*	78
DAY 3	124	119*	578	78*	147	246	134	68	23*	13	58	23*	20*	32*	61*
DAY 4	436*	157*	633	103*	399	78*	60	41	30*	24*	40	30*	26*	41*	77*
DAY 5	302*	109*	1114	72*	362	54*	71	35	21*	17*	52	21*	18*	29*	33
DAY 6	1421	169*	984	110*	528	84*	90	40	32*	13	54	32*	28*	45*	64*
DAY 7	891	607	269	119*	344	90*	80	17	35*	28*	21	35*	30*	51*	96*
DAY 8	1244	137*	830	89*	512	68*	64	49	26*	21*	62	26*	22*	38*	72*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** JULY 16 TO JULY 21,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1164*	1586	4836	181*	128*	130*	424	333	43*	27	551	42*	37*	72*	138*
DAY 2	1072*	1630	4662	168*	119*	120*	464	307	40*	17	598	39*	35*	63*	120*
DAY 3	1230*	1744	5375	192*	136*	138*	465	401	46*	37*	562	45*	40*	63*	95
DAY 4	936	1204	3198	161*	114*	116*	254	228	39*	31*	359	38*	33*	21	108*
DAY 5	871*	747	2912	137*	97*	98*	265	247	33*	16	366	32*	28*	28	96*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1268	151*	601	98*	471	75*	64	35	29*	23*	45	29*	19	41*	37
DAY 2	1152	434	563	102*	607	77*	115	50	30*	24*	62	30*	26*	42*	79*
DAY 3	1263	674	999	107*	415	81*	83	56	31*	25*	42	31*	27*	44*	176
DAY 4	1294	675	1111	117*	468	89*	85	38	34*	28*	65	34*	27	52*	99*
DAY 5	722	790	653	109*	542	82*	91	45	32*	26*	39	32*	16	45*	84*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** JULY 21 TO JULY 29,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1034*	1208	4655	162*	115*	117*	564	462	39*	20	589	39*	34*	42	109*
DAY 2	5926	1706	7810	194*	419	301	845	1063	62	22	906	46*	40*	89*	170*
DAY 3	3174	2263	8172	239*	128	172*	737	808	51	47*	888	57*	50*	145*	278*
DAY 4	1016*	1896	6691	159*	113*	114*	664	593	38*	13	897	38*	33*	64*	122*
DAY 5	851*	1355	5097	134*	95*	96*	492	417	69	21	676	32*	28*	44*	64*
DAY 6	1131	1957	8310	372*	138	267*	835	861	93	47	956	88*	77*	83	217*
DAY 7	915*	555	2198	144*	102*	40	268	256	27	28*	279	34*	30*	19	96
DAY 8	795*	1135	5155	125*	89*	90*	532	490	57	20	602	30*	26*	38*	72*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	459*	165*	874	108*	419	82*	36	32	32*	26*	22	32*	27	41*	78*
DAY 2	2901	847	1239	109*	979	82*	261	265	32*	26*	178	32*	15	46*	35
DAY 4	1271	632	499	94*	674	71*	254	91	28*	22*	46	28*	24*	42*	135
DAY 5	1232	578	1071	105*	1137	80*	127	67	31*	25*	136	31*	13	45*	84*
DAY 6	427	272*	212	179*	392	136*	104	98	53*	18	22	53*	66	81*	153*
DAY 7	529*	496	1780	123*	693	93*	45	44	36*	29*	26	36*	19	50*	104
DAY 8	359*	128*	539	84*	455	64*	50	37	25*	11	35	25*	21*	36*	103

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** JULY 29 TO AUGUST 5,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	885*	342	2614	139*	52	38	189	159	17	10	258	33*	29*	26	78*
DAY 2	725*	515	1768	114*	38	82*	198	192	27*	10	231	27*	24*	20	65*
DAY 3	858	246*	533	141*	100*	101*	58*	41	34*	27*	20	33*	29*	31	81*
DAY 4	740*	196	860	116*	83*	83*	95	104	28*	22*	85	28*	24*	28	66*
DAY 5	930*	424	1515	146*	63	105*	144	167	35*	16	285	35*	15	32	83*
DAY 6	1004*	1119	940	157*	112*	336	114	64	38*	16	129	37*	32*	47*	90*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	352*	253	290	84*	313	63*	41*	18	25*	20*	19	25*	13	35*	66*
DAY 2	407*	146*	225	59	139	73*	35	26	28*	23*	12	28*	24*	41*	77*
DAY 3	507	139	103*	62	63	62*	40*	28*	24*	19*	19*	24*	21*	35*	66*
DAY 4	534	239	581	78*	618	59*	83	57	23*	19*	75	23*	20*	32*	60*
DAY 5	557	123*	337	81*	298	61*	40*	13	24*	19*	19*	24*	20*	33*	62*
DAY 6	373	87	59	80*	64	61*	40*	14	24*	19*	19*	24*	20*	41*	78*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** AUGUST 5 TO AUGUST 12,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1179*	1924	7491	185*	131*	133*	602	535	55	20	789	44*	38*	55*	80
DAY 2	1238*	649	3917	194*	138*	140*	352	326	47*	18	379	46*	40*	59*	112*
DAY 3	901*	1265	6822	141*	101*	102*	651	473	72	23	788	34*	29*	22	80*
DAY 4	2855	2564	8649	145*	103*	104*	758	587	55	15	970	34*	30*	32	84*
DAY 5	837*	748	3461	131*	93*	95*	414	315	56	23	424	31*	27*	30	80*
DAY 6	1095*	655	2703	172*	122*	206	379	320	41*	33*	354	41*	36*	34	104*
DAY 7	1202*	2151	10530	189*	134*	136*	803	785	66	28	1021	45*	39*	56*	106*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	886	142*	687	93*	300	71*	94	60	27*	22*	49	27*	24*	45*	50
DAY 2	410*	274	1010	97*	231	73*	46	62	28*	8	41	28*	24*	46*	86*
DAY 3	391*	142*	343	93*	228	71*	42	32*	28*	13	33	28*	24*	45*	84*
DAY 4	337*	121*	615	80*	283	33	73	42	23*	19*	77	23*	20*	34*	65*
DAY 5	449	146*	488	96*	374	72*	52	25	28*	23*	35	28*	24*	39*	73*
DAY 6	456*	287	401	109*	328	83*	37	18	32*	26*	30	32*	28*	43*	82*
DAY 7	757	523	290	60	317	82*	50	45	32*	26*	46	32*	17	47*	88*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** AUGUST 12 TO AUGUST 20,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1248*	2100	8640	196*	139*	140*	625	645	59	29	901	47*	40*	58*	110*
DAY 2	676	1472	5945	197*	140*	141*	521	487	47*	19	637	47*	41*	34	61
DAY 3	885*	1505	5542	139*	99*	100*	498	426	39	19	642	33*	29*	32	50
DAY 4	552	1254	4159	142*	101*	102*	347	310	51	18	518	34*	19	36	85*
DAY 5	1097*	1455	4817	172*	122*	194	408	439	41*	17	586	41*	35*	33	101*
DAY 6	1285*	1441	4279	200*	142*	619	401	369	66	19	477	47*	41*	55	119*
DAY 7	905*	1004	3258	142*	101*	102*	328	282	34*	21	425	34*	29*	47*	90*
DAY 8	912*	1002	4849	143*	102*	103*	447	397	41	10	588	34*	30*	42	87*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	347*	126	362	83*	265	63*	51	29	25*	12	61	25*	10	34*	64*
DAY 2	445*	161*	759	105*	288	80*	63	38	31*	25*	23	31*	10	42*	95
DAY 3	408*	146*	775	96*	273	73*	66	35	28*	23*	72	28*	24*	39*	73*
DAY 4	859	487	557	92*	615	70*	91	44	27*	22*	71	27*	23*	36*	65
DAY 5	362	395	618	110*	841	83*	97	62	32*	26*	82	32*	28*	44*	83*
DAY 6	416*	151*	385	99*	517	75*	56	56	29*	24*	43	29*	25*	41*	77*
DAY 7	582	292	542	95*	911	72*	69	53	28*	23*	48	28*	10	38*	72*
DAY 8	385*	138*	876	90*	366	68*	46	33	26*	21*	54	26*	23*	37*	78

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** AUGUST 20 TO AUGUST 25,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	944*	1201	4783	148*	105*	107*	429	444	61	22	631	35*	31*	29	89*
DAY 2	943*	259*	1018	148*	49	106*	113	94	36*	29*	114	35*	16	33	88*
DAY 3	354	1057	4751	138*	98*	65	432	461	33*	10	560	33*	29*	42*	81*
DAY 4	990	966	2411	141*	100*	49	239	276	17	27*	290	33*	29*	43*	106
DAY 6	1085*	1038	3604	170*	121*	122*	261	343	41*	24	409	40*	35*	36	97*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	586	202	521	82*	740	62*	134	61	24*	19*	74	24*	21*	33*	62*
DAY 2	374*	135*	112*	197	71*	67*	33	30*	26*	16	21*	26*	27	37*	69*
DAY 3	1411	136*	1333	89*	1125	67*	117	78	26*	21*	89	26*	13	37*	69*
DAY 4	1445	354	253	87*	593	66*	52	33	26*	21*	34	25*	22*	35*	75
DAY 6	385*	651	253	91*	362	69*	32	66	27*	21*	36	27*	13	37*	70*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** SEPTEMBER 2 TO SEPTEMBER 9,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	8384	3421	10138	479*	118	891	962	720	115*	92*	1121	114*	56	84	295*
DAY 2	913*	1519	5236	143*	102*	103*	489	444	48	28*	690	34*	30*	27	92*
DAY 3	839*	327	2163	132*	94*	95*	245	209	32*	26*	258	31*	27*	48*	92*
DAY 4	1187*	4408	19448	186*	132*	133*	1552	1450	211	47	2170	44*	38*	24	119*
DAY 5	846*	979	3173	133*	42	95*	309	292	37	21	414	32*	27*	28	89*
DAY 6	962*	1225	3269	150*	107*	72	336	272	36*	17	370	36*	31*	51*	45
DAY 7	384	496	1958	151*	43	254	223	185	36*	15	233	36*	18	34	100*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1028*	374*	650	246*	460	186*	110	57	73*	59*	81	73*	62*	113*	212*
DAY 2	413*	148*	630	47	393	74*	66	62	29*	23*	69	29*	25*	40*	76*
DAY 3	359*	130*	112	139	64	65*	42*	29*	25*	20*	20*	25*	22*	35*	67*
DAY 4	1508	149*	765	97*	531	74*	89	45	28*	23*	67	28*	12	39*	73*
DAY 5	371*	222	380	87*	522	66*	58	48	26*	21*	47	26*	18	35*	66*
DAY 6	172	60	254	76*	366	57*	64	44	22*	18*	38	22*	19*	31*	59*
DAY 7	614*	220*	655	144*	427	109*	52	30	42*	34*	16	42*	19	60*	114*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** SEPTEMBER 9 TO SEPTEMBER 15,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1691*	464*	1245	265*	108	191*	161	166	64*	21	133	64*	86	96*	182*
DAY 2	874*	394	714	136*	97*	73	75	57	33*	10	70	32*	24	20	85*
DAY 3	1014*	243	1133	159*	113*	114*	69	105	38*	31*	61	38*	33*	21	96*
DAY 4	280	877	3873	134*	95*	96*	315	287	42	11	377	32*	17	43*	82*
DAY 6	1578	661	1252	152*	108*	158	93	84	36*	29*	87	36*	31*	25	92*
DAY 7	878*	773	3128	137*	98*	77	262	255	32	27*	338	33*	28*	31	85*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	794*	853	239*	75	285	144*	94*	64*	56*	45*	45*	56*	48*	82*	155*
DAY 2	1162	459	325	95	159	74*	48*	15	29*	23*	23*	28*	24*	40*	75*
DAY 3	486	305	106*	74	40	64*	42*	29*	25*	8	20*	25*	15	36*	68*
DAY 4	118	73	37	75*	129	57*	34	25*	22*	18*	18*	22*	15	33*	62*
DAY 6	328*	120*	99*	39	32	60*	24	27*	23*	10	19*	23*	20*	34*	65*
DAY 7	406*	497	257	96*	263	73*	26	16	28*	23*	12	28*	24*	40*	76*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** SEPTEMBER 15 TO SEPTEMBER 22,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	696*	410	2776	109*	78*	79*	326	296	58	17	427	27*	28	29	70*
DAY 2	980	2768	11068	149*	106*	107*	988	833	112	31	1224	35*	31*	28	90*
DAY 3	818*	630	2401	128*	91*	92*	267	266	31*	18	292	31*	27*	39	64*
DAY 4	796*	219*	2618	125*	89*	90*	280	245	39	10	358	30*	26*	33	79*
DAY 5	714*	207	2308	112*	80*	81*	270	192	46	22*	328	27*	32	21	73*
DAY 6	842*	231*	1811	132*	94*	95*	230	198	32*	17	244	31*	27*	26	84*
DAY 7	718*	470	3457	113*	80*	122	311	297	51	22*	307	27*	20	38*	73*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	338*	122*	238	80*	317	61*	39	22	24*	19*	27	24*	15	34*	65*
DAY 2	348*	278	1545	81*	506	61*	80	39	24*	19*	74	24*	20*	34*	369
DAY 3	285*	104*	159	69*	131	52*	27	50	20*	16*	41	20*	17*	30*	57*
DAY 4	349*	244	198	27	140	63*	19	26	25*	20*	20*	24*	21*	37*	69*
DAY 5	364*	359	81	38	25	66*	16	10	26*	10	21*	26*	22*	38*	72*
DAY 6	477*	615	151	81	152	85*	55*	38*	33*	10	27*	33*	15	44*	84*
DAY 7	1229	138*	114*	47	56	69*	31	13	27*	22*	22*	27*	23*	39*	42

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** SEPTEMBER 22 TO SEPTEMBER 29,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1079	1908	4833	305*	67	243	450	474	73*	25	592	73*	45	100*	191*
DAY 2	721*	363	2058	113*	32	28	237	222	27*	22	250	27*	24*	24	75*
DAY 3	1138*	1571	4358	177*	126*	127*	430	382	42*	27	430	42*	36*	36	112*
DAY 4	957*	1299	3724	150*	107*	106	370	322	36*	15	454	36*	31*	50*	95*
DAY 6	2024*	4634	23659	318*	226*	133	2180	2146	243	57	2726	76*	21	111*	212*
DAY 7	832*	415	2279	131*	93*	94*	225	235	37	25*	350	31*	15	45*	87*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	963*	347*	1091	227*	784	172*	81	53	67*	54*	33	67*	43	91*	207
DAY 2	127	116*	1091	76*	225	58*	50	43	22*	8	46	22*	9	31*	58*
DAY 3	296*	108*	249	71*	134	54*	71	41	21*	17*	39	21*	18	29*	56*
DAY 4	433*	315	751	102*	202	142	154	84	30*	24*	58	30*	12	42*	80*
DAY 6	973*	353*	638	92	209	176*	59	78*	68*	55*	55*	68*	59*	103*	80
DAY 7	594	289	309	99*	143	75*	23	22	29*	23*	22	29*	15	44*	82*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** SEPTEMBER 29 TO OCTOBER 7,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1071*	317*	15027	204*	151*	147*	1144	854	76	18	1253	46*	41*	66*	125*
DAY 2	486	908	5540	175*	169	155	460	453	40*	33*	573	39*	35*	55*	101*
DAY 3	912*	271*	2201	175*	129*	156	159	111	40*	33*	183	39*	35*	59*	112*
DAY 4	928*	276*	8951	70	56	129*	813	831	61	34*	955	40*	35*	63*	120*
DAY 5	985*	289*	8495	393	313	417	680	572	61	35*	836	41*	17	62*	118*
DAY 6	3328	358*	11749	231*	171*	104	926	769	74	44*	1083	51*	46*	74*	142*
DAY 7	1091*	323*	15297	206*	154*	75	1357	966	122	14	1519	46*	41*	74*	141*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	533*	200*	2234	147*	879	113*	138	75	41*	34*	132	40*	31	63*	69
DAY 2	1583*	323*	2935	184*	830	128*	175	72	41*	33*	95	39*	34*	58*	110*
DAY 3	1268*	279*	222*	986	129*	131	69*	46*	23	31*	30*	37*	21	56*	105*
DAY 4	391*	151*	1237	111*	430	85*	118	56	21	26*	55	31*	27*	49*	66
DAY 5	1550*	317*	2555	180*	656	126*	100	46	40*	32*	46	38*	33*	54*	102*
DAY 6	1925*	349*	2923	182*	741	123*	208	73	37*	29*	93	35*	16	55*	103*
DAY 7	1265*	288*	2288	173*	447	123*	268	56	41*	33*	96	39*	34*	68*	128*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** OCTOBER 7 TO OCTOBER 14,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1034*	305*	7476	196*	145*	442	668	494	73	37*	724	44*	39*	66*	126*
DAY 2	1083	364*	6305	234*	173*	192	550	371	54*	45*	570	52*	21	78*	128
DAY 3	1081*	321*	7325	207*	153*	184	551	552	75	39*	701	46*	41*	72*	138*
DAY 4	3538	379*	14099	244*	181*	74	1135	978	90	47*	1560	54*	48*	79*	61
DAY 5	1220*	359*	7593	231*	171*	423	507	539	53*	44*	728	51*	46*	76*	144*
DAY 6	898	293*	5306	188*	140*	136*	410	375	44*	36*	538	42*	37*	67*	128*
DAY 7	1420*	421*	6303	271*	132	94	555	386	63*	52*	674	61*	54*	100*	190*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	2820	333*	3155	192*	696	134*	161	67	23	35*	107	41*	36*	61*	115*
DAY 2	1721*	343*	3104	193*	744	135*	149	57	42*	34*	54	40*	35*	59*	112*
DAY 3	2079*	396*	3312	215*	892	148*	99	83	45*	36*	68	20	38*	63*	118*
DAY 4	1803*	327*	2292	172*	744	117*	165	60	16	28*	75	33*	29*	53*	100*
DAY 5	493*	188*	1828	138*	659	106*	200	94	39*	32*	114	38*	33*	62*	132
DAY 6	501*	191*	1684	140*	495	107*	73	29	39*	33*	25	27	34*	63*	43
DAY 7	628*	240*	1754	176*	690	118	319	78	49*	41*	25	20	42*	79*	70

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** OCTOBER 14 TO OCTOBER 22,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1368*	400*	2836	257*	440	186	235	100	59*	49*	165	57*	51*	90*	173*
DAY 2	1078*	320*	2411	207*	212	89	224	161	42	39*	218	46*	20	66*	127*
DAY 3	1234*	361*	5541	232*	561	135	382	395	53*	44*	495	51*	46*	69*	132*
DAY 4	1377*	405*	4672	261*	193*	188*	303	287	60*	50*	376	58*	51*	77*	147*
DAY 5	1533	348*	6294	224*	166*	1596	483	489	51*	42*	634	49*	44*	68*	130*
DAY 6	1622*	476*	7726	307*	227*	436	593	519	70*	58*	713	68*	60*	93*	177*
DAY 7	1161*	343*	18709	220*	163*	499	1447	1163	163	25	1719	49*	44*	74*	65
DAY 8	4515*	1324*	25087	852*	631*	384	1500	1653	196*	162*	2005	189*	168*	287*	547*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1539*	318*	2911	182*	1008	127*	163	50*	41*	33*	32*	39*	34*	59*	114
DAY 2	1120*	260*	1038	158*	505	113*	77	45*	37*	30*	30*	36*	32*	52*	98*
DAY 3	1202*	261*	1412	153*	647	152	123	51	35*	28*	33	34*	16	46*	88*
DAY 4	3709*	609*	4441	290*	863	189*	85	83	52*	40*	39*	38	42*	73*	91
DAY 5	1843*	335*	1983	175*	632	119*	258	172	36*	28*	45	14	23	49*	92*
DAY 6	702*	265*	2979	195*	163*	149*	116	33	26	45*	24	53*	47*	76*	142*
DAY 7	1577*	292*	1638	155*	97	105*	45	23	32*	25*	12	30*	21	46*	88*
DAY 8	4972*	974*	4820	539*	2062	372*	529	140	116*	93*	175	97	97*	163*	308*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE MONO LAKE AREA

MONO LAKE DAILY-LEE VINING ** OCTOBER 22 TO OCTOBER 28,1980 **

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	1478*	2860	5223	281*	208*	217	362	333	52	54*	512	63*	56*	97*	185*
DAY 2	4248	550*	8231	354*	263*	326	529	546	81*	67*	641	78*	70*	109*	208*
DAY 3	1682*	492*	7138	895	713	128	479	459	73*	60*	619	70*	21	101*	194*
DAY 4	1399*	412*	8043	265*	197*	524	569	574	88	51*	716	59*	53*	86*	168*
DAY 5	1789*	529*	4025	341*	253*	279	412	267	79*	65*	356	76*	68*	151*	288*
DAY 6	1773*	528*	4400	108	252*	547	477	373	79*	65*	558	76*	68*	130*	247*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	NA	AL	SI	P	S	CL	K	CA	TI	MN	FE	V	CR	BR	PB
DAY 1	596*	408	1268	170*	660	129*	115	28	15	40*	57	46*	41*	70*	132*
DAY 2	674*	254*	2723	187*	839	253	171	36	52*	43*	75	44	45*	77*	96
DAY 3	2545*	500*	4041	277*	1557	192*	202	72	60*	48*	120	57*	50*	83*	157*
DAY 4	3184*	543*	3690	270*	1658	178*	290	83	51*	40*	100	48*	42*	70*	132*
DAY 5	906*	343*	2919	251*	1099	192*	145	59	42	58*	68	68*	60*	106*	200*
DAY 6	1764*	1445	884	988	820	195*	117*	79*	66*	54*	31	63*	56*	106*	67

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

OWENS VALLEY STUDY

MONO LAKE MONITORING

April 19, 1979 - June 11, 1979

* * * * * * * * * * * * *

U.C.D. - ARB INVESTIGATION OF AIR QUALITY IN THE OWENS VALLEY

WEEKLY MONITORING STUDY

Gravimetric Mass - Micrograms Per Cubic Meter

Mono Lake Area Samples

	STAGE 1	STAGE 2	TOTAL
4/19 - 4/23	13.7	8.4	22.1
4/23 - 4/30	2.2	3.4	5.6
4/30 - 5/7	13.0	8.5	21.5
5/7 - 5/14	10.8	5.0	15.8
5/14 - 5/21	11.5	5.6	17.1
5/21 - 5/28	15.1	6.0	21.1
5/28 - 6/4	34.4	4.0	38.4
6/4 - 6/11	46.8	4.4	51.2

UCD-ARB INVESTIGATION OF AIR QUALITY AT MONO LAKE

MONO LAKE MONITORING STUDY

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	S	PB	BR	AL	SI	K	CA	TI	MN	FE	ZN	V	NA	CL	SE
APRIL 24 - APRIL 30	93	24*	572	385	1792	200	406	22	9*	287	7	11*	321*	33	10*
APRIL 30 - MAY 7	12	14*	284	58	343	47	97	6*	4*	62	3	5*	497	18*	6*
MAY 7 - MAY 14	24	11*	171	235	1362	155	229	15	5	205	5	4*	457	9	4*
MAY 14 - MAY 21	21	21*	407	420	2222	208	331	24	6	314	8	9*	261*	30*	9*
MAY 21 - MAY 28	70	16*	8*	39*	1902	200	365	27	6	315	5	6*	172*	20*	6*
MAY 28 - JUNE 4	41	17*	11	47*	2743	273	395	33	9	394	5	7*	305	24*	7*
JUNE 4 - JUNE 11	22*	18*	9*	45*	5420	555	642	70	18	825	10	7*	470	22*	7*
JUNE 11 - JUNE 18	94	27*	13*	776	10066	992	1150	83	27	1278	21	11*	329*	37*	10*

FINE PARTICLES (LESS THAN 2.5 MICRONS)

	S	PB	BR	AL	SI	K	CA	TI	MN	FE	ZN	V	NA	CL	SE
APRIL 24 - APRIL 30	184	24*	13*	47*	1366	153	328	18	8*	231	6	10*	163*	28*	11*
APRIL 30 - MAY 7	140	21*	11*	116	439	59	115	15	5*	86	3	6*	101*	18*	9*
MAY 7 - MAY 14	270	12	4	21*	1121	109	182	13	3	144	7	4*	150	12*	4*
MAY 14 - MAY 21	277	10	6*	107	449	65	106	6*	5*	83	4	6*	92*	16*	5*
MAY 21 - MAY 28	399	17	4	222	508	96	124	9	4*	104	5	4*	76*	13*	4*
MAY 28 - JUNE 4	457	19	5	21*	463	80	91	8	4*	89	2*	4*	73*	12*	4*
JUNE 4 - JUNE 11	155	12*	7	24*	684	65	96	6	4*	87	2	5*	117	14*	5*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

OWENS VALLEY STUDY

WIND DATA

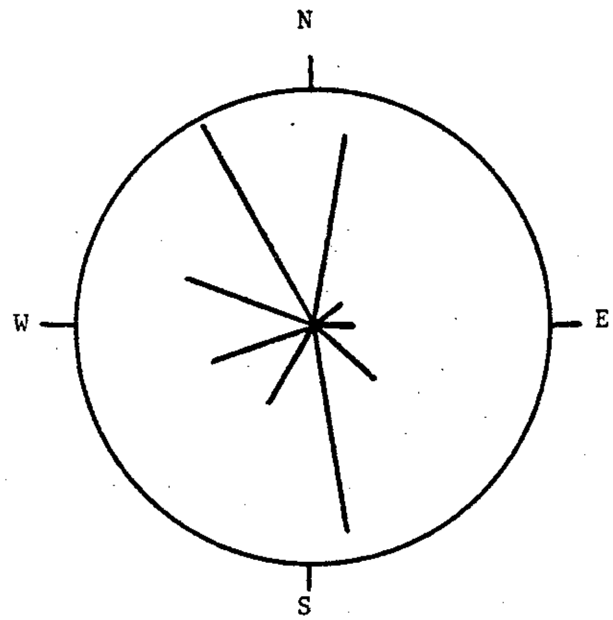
* * * * * * * * * *

WIND ROSE DIAGRAMS

SURFACE WINDS AT BISHOP AIRPORT

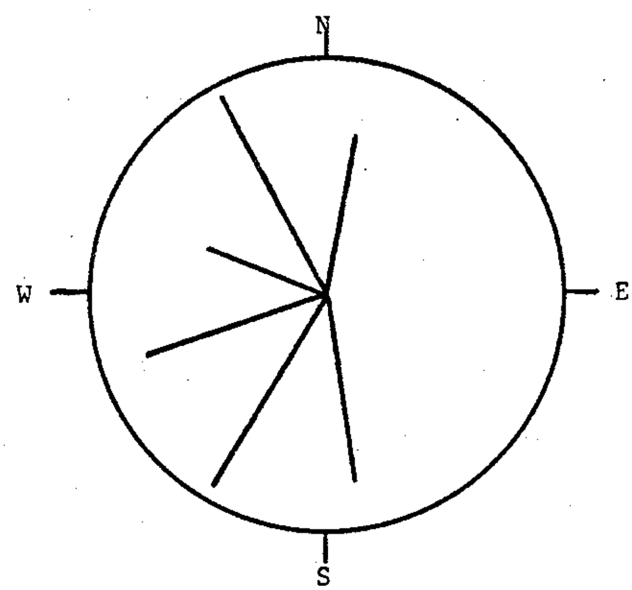
Monitoring Period

February 20 - June 18 ,1979



DUST STORM PERIODS

April 5,6,7,15,16,17,22,23



OBSERVATIONS AT 3-HOUR INTERVALS — May 1979

Day	Hour	Sky cover (tenths)	Ceiling (hnds. of ft.)	Visibility: whole miles	Visibility: 16ths mile	Weather	Air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01	01						51					
01	04						49					
01	07	0	UNL	70			58	43	24	26	35	16
01	10	0	UNL	70			68	44	14	13	28	6
01	13	3	UNL	70			74	47	10	08	36	9
01	16	8	200	40			69	46	17	14	34	15
01	19	10	140	15			55	44	32	42	33	14
01	22						56					
02	01						51					
02	04						48					
02	07	10	70	70		R	53	46	40	62	03	17
02	10	8	70	50			63	49	37	38	36	7
02	13	5	UNL	50			71	50	30	22	34	15
02	16	2	UNL	50			73	50	28	19	36	15
02	19	0	UNL	15			67	48	29	24	34	8
02	22						59					
03	01						50					
03	04						47					
03	07	7	UNL	70			52	42	32	47	30	6
03	10	0	UNL	70			70	49	30	23	30	7
03	13	3	UNL	70			77	50	22	13	34	3
03	16	3	UNL	70			82	52	22	11	20	10
03	19	4	UNL	70			74	50	26	17	16	10
03	22						63					
04	01						51					
04	04						45					
04	07	10	250	70			55	46	37	51	36	4
04	10	10	200	70			71	52	36	28	24	8
04	13	10	180	50			79	53	28	15	16	10
04	16	9	180	50			80	53	26	14	15	15
04	19	9	180	70			75	47	09	08	26	11
04	22						65					
05	01						48					
05	04						42					
05	07	10	220	70			51	39	22	32	06	4
05	10	9	220	70			77	48	07	07	16	9
05	13	8	180	70			78	51	22	12	30	20
05	16	4	UNL	70			73	48	21	14	25	38
05	19	8	180	70			67	45	15	13	34	8
05	22						56					
06	01						52					
06	04						49					
06	07	10	200	70			55	42	26	33	15	4
06	10	5	UNL	70			70	46	14	11	01	13
06	13	8	220	70			73	46	05	07	02	16
06	16	7	200	70			70	46	16	13	35	18
06	19	2	UNL	70			58	41	18	21	02	13
06	22						47					
07	01						43					
07	04						43					
07	07	8	UNL	70			53	40	24	32	16	3
07	10	7	90	70			64	43	13	14	26	17
07	13	5	UNL	70			65	43	11	12	23	22
07	16	7	90	70			61	42	14	18	25	20
07	19	8	200	50			51	37	17	26	33	7
07	22						46					
08	01						43					
08	04						37					
08	07	10	80	70			45	33	11	25	01	15
08	10	10	80	70			49	36	16	27	02	16
08	13	9	80	50			47	38	25	42	02	15
08	16	9	80	70		T	49	39	26	41	34	18
08	19	9	60	30			43	37	30	60	28	8
08	22						43					
09	01						35					
09	04						36					
09	07	8	80	70			46	36	23	40	01	15
09	10	7	80	70			52	38	17	25	33	16
09	13	5	UNL	70			59	41	13	18	35	16
09	16	4	UNL	50			59	42	19	21	34	17
09	19	2	UNL	70			53	40	24	32	35	13
09	22						46					
10	01						39					
10	04						37					
10	07	0	UNL	70			50	39	24	36	01	10
10	10	0	UNL	70			61	44	25	25	02	10
10	13	0	UNL	70			64	44	18	17	32	5
10	16	0	UNL	70			70	46	13	11	29	10
10	19	0	UNL	70			64	43	13	14	35	7
10	22						57					
11	01						48					
11	04						41					
11	07	0	UNL	70			51	40	25	36	36	3
11	10	0	UNL	70			67	46	20	17	26	5
11	13	0	UNL	70			75	49	17	11	10	6
11	16	0	UNL	70			80	51	20	11	23	5
11	19	0	UNL	70			71	47	18	13	00	0
11	22						59					
12	01						52					
12	04						44					
12	07	0	UNL	70			55	42	26	33	32	5
12	10	0	UNL	70			72	48	21	14	20	5
12	13	0	UNL	70			79	50	16	09	25	7
12	16	0	UNL	70			83	51	13	07	22	10
12	19	0	UNL	70			74	47	12	09	18	11
12	22						61					
13	01						47					
13	04						43					
13	07	0	UNL	70			57	42	24	28	32	5
13	10	0	UNL	70			74	49	22	14	00	0
13	13	0	UNL	70			85	51	08	05	20	10
13	16	0	UNL	70			85	51	09	05	21	9
13	19	0	UNL	70			74	48	16	11	18	9
13	22						64					
14	01						49					
14	04						43					
14	07	0	UNL	70			55	41	23	29	33	4
14	10	0	UNL	70			76	48	11	08	17	5
14	13	0	UNL	70			83	50	04	05	13	5
14	16	0	UNL	70			86	52	13	06	18	13
14	19	0	UNL	70			76	50	24	14	25	10
14	22						62					
15	01						52					
15	04						47					
15	07	5	UNL	70			58	44	29	33	06	4
15	10	2	UNL	70			76	51	24	13	18	12
15	13	1	UNL	50			85	53	19	08	17	18
15	16	3	UNL	50			85	53	19	09	18	14
15	19	3	UNL	50			75	50	23	14	15	11
15	22						64					
16	01						53					
16	04						46					
16	07	0	UNL	70			57	45	34	42	32	5
16	10	0	UNL	70			76	52	29	18	00	0
16	13	2	UNL	70			82	52	20	10	18	8
16	16	2	UNL	70			84	52	17	08	21	8
16	19	2	UNL	70			76	50	22	13	35	6
16	22						61					
17	01						51					
17	04						48					
17	07	0	UNL	70			63	48	35	35	30	4
17	10	0	UNL	70			77	52	29	17	18	4
17	13	1	UNL	70			83	53	24	11	27	8
17	16	1	UNL	70			86	53	19	08	17	7
17	19	7	UNL	70			76	50	23	14	18	8
17	22						69					
18	01						58					
18	04						51					
18	07	0	UNL	70			69	48	26	20	32	11
18	10	0	UNL	70			79	51	24	13	03	11
18	13	0	UNL	70			88	55	25	10	29	4
18	16	0	UNL	70			89	55	24	09	22	3
18	19	0	UNL	70			82	53	25	12	34	10
18	22						68					
19	01						58					
19	04						51					
19	07	0	UNL	70			66	49	32	28	32	8
19	10	0	UNL	70			82	54	30	15	35	7
19	13	0	UNL	70			87	55	26	11	35	11
19	16	2	UNL	70			88	55	23	09	35	8
19	19	1	UNL	70			81	53	26	13	35	13
19	22						70					
20	01						58					
20	04						52					
20	07	0	UNL	70			67	47	28	23	33	5
20	10	0	UNL	70			82	53	26	13	21	6
20	13	0	UNL	70			89	55	23	09	21	9
20	16	1	UNL	70			92	55	17	06	26	8
20	19	2	UNL	70			83	55	30	15	18	6
20	22						72					
21	01						58					
21	04						52					
21	07	0	UNL	70			65	48	31	28	32	6
21	10	0	UNL	70			83	56	38	19	36	6
21	13	2	UNL	70			91	56	24	09	08	6
21	16	3	UNL	70			92	57	26	09	19	11
21	19	3	UNL	70			82	56	38	19	16	15
21	22						73					
22	01						69					
22	04						56					
22	07	10	UNL	40			68	50	36	33	30	3
22	10	10	UNL	40			84	56	34	17	18	10
22	13	8	250	70			87	55	24	10	17	10
22	16	9	250	70			88	55	24	10	14	13
22	19	10	200	70			80	53	26	14	16	12
22	22						74					
23	01						66					
23	04						62					
23	07	10	250	70			69	52	38	32	34	10
23	10	10	200	70			77	53	32	19	30	7
23	13	9	200	70			83	54	27	13	30	7
23	16	8	200	70			82	53	25	12	24	16
23	19	8					71					
23	22						63					
24	01						60					
24	04						54					
24	07	7	200	70			65	50	37	36	01	12
24	10	4	UNL	70			75	53	38	24	35	10
24	13	9	100	70			72	53	38	28	27	16
24	16	8	100	70			78	54	33	19	02	11
24	19	7	100	50			72	53	37	28	18	4
24	22						65					
25	01						59					
25	04						55					
25	07	0	UNL	70			65	51	38	37	35	9
25	10	1	UNL	70			77	55	38	25	17	3
25	13	4	UNL	70			83	57	37	19	35	8
25	16	8	100	70			85	57	35	17	15	4
25	19	1	UNL	70			78	56	41	27	09	4
25	22						66					
26	01						59					
26	04						55					
26	07	0	UNL	70			70	53	38	31	36	8
26	10	1	UNL	70			83	58	38	20	12	5
26	13	3	UNL	70			90	58	33	13	09	7
26	16	8	100	70			92	59	32	12	25	10
26	19	8	100	50			86	57	32	14	36	8
26	22						73					
27	01						62					
27	04						57					
27	07	0	UNL	70			66	53	43	43	31	4
27	10	3	UNL	50			85	60	42	22	17	15
27	13	9	250	50			92	60	37	14	15	17
27	16	4	UNL	50			91	56	23	08	24	10
27	19	2					77					
27	22						67					
28	01						58					
28	04						48					
28	07	0	UNL	70			65	48	32	29	00	0
28	10	0	UNL	70			77	52	29	17	22	6
28	13	2	UNL	50			87	55	27	11	17	21
28	16	4	UNL	50			86	57	33	15	16	20
28	19	2					77					
28	22						66					
29	01						57					
29	04						51					
29	07	0	UNL	70			54	39	20	26	36	20
29	10	0	UNL	70			64	44	16	17	01	14
29	13	0	UNL	70			71	47	19	14	27	6
29	16	0	UNL	70			75	50	23	14	32	6
29	19	0					68					
29	22						61					
30	01						56					
30	04						51					
30	07	0	UNL	70			61	41	11	14	36	14
30	10	0	UNL	70			71	49	25	18	36	17
30	13	2	UNL	70			77	48	12	08	03	9
30	16	2	UNL	70			79	48	05	06	34	10
30	19	1					69					
30	22						61					
31	01						51					
31	04						46					
31	07	0	UNL	70			57	41	20	24	00	0
31	10	5	UNL	70			70	46	17	13	26	4
31	13	8	UNL	70			78	49	14	09	26	8
31	16	4	UNL	70			80	51	19	10	26	6
31	19	2	UNL	70			72	49	26	18	13	5
31	22						60					

NOTES

CEILING

UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH: I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 79 05

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

U.S.MAIL
FIRST CLASS

OBSERVATIONS AT 3-HOUR INTERVALS — June 1979

Day	Hour	Sky Cover (Tenths)	Ceiling (Hnds. of Ft.)	Visibility Whole Miles	Visibility 16ths Mile	Weather	Air °F	Wet Bulb °F	Dew Pt. °F	Rel. Hum. %	Wind Dir	Wind Speed Knots
01	01						54					
01	04						48					
01	07	1	UNL	70			63	44	21	20	31	5
01	10	0	UNL	70			76	49	17	11	26	5
01	13	0	UNL	70			81	51	17	09	02	4
01	16	1	UNL	70			84	52	16	08	20	8
01	19	3	UNL	70			79	49	12	08	10	7
01	22						64					
02	01						51					
02	04						48					
02	07	0	UNL	70			64	45	24	22	29	6
02	10	0	UNL	70			78	50	20	11	32	5
02	13	0	UNL	70			84	52	17	08	32	5
02	16	0	UNL	70			87	53	15	07	27	7
02	19	0	UNL	70			80	51	18	10	16	9
02	22						69					
03	01						59					
03	04						50					
03	07	0	UNL	70			65	45	23	20	33	5
03	10	0	UNL	70			80	52	25	13	15	8
03	13	1	UNL	70			88	54	19	08	20	8
03	16	1	UNL	70			89	54	14	06	26	8
03	19	2	UNL	70			81	53	27	14	18	6
03	22						70					
04	01						56					
04	04						53					
04	07	1	UNL	70			67	50	34	30	32	6
04	10	1	UNL	70			85	57	36	17	25	5
04	13	10	100	50			91	58	32	12	32	6
04	16	10	100	70			86	57	36	17	33	11
04	19	8					76					
04	22						66					
05	01						59					
05	04						54					
05	07	7	UNL	70			70	53	40	34	32	4
05	10	1	UNL	70			85	58	39	20	23	5
05	13	1	UNL	70			94	59	33	12	24	7
05	16	1	UNL	70			96	59	30	10	24	11
05	19	0					86					
05	22						79					
06	01						68					
06	04						60					
06	07	0	UNL	70			70	53	40	34	00	0
06	10	0	UNL	70			89	56	25	10	04	3
06	13	0	UNL	70			96	57	19	06	33	14
06	16	0	UNL	70			93	57	25	09	25	14
06	19	0					80					
06	22						73					
07	01						66					
07	04						61					
07	07	0	UNL	40			62	44	23	22	36	21
07	10	0	UNL	20			69	47	22	17	36	21
07	13	1	UNL	20			76	48	17	11	35	20
07	16	3	UNL	20			73	47	13	10	36	25
07	19	0					63					
07	22						51					
08	01						48					
08	04						40					
08	07	0	UNL	70			56	40	16	21	32	3
08	10	0	UNL	70			66	44	15	14	27	6
08	13	0	UNL	70			75	46	14	10	30	9
08	16	0	UNL	70			81	51	17	09	01	13
08	19	0	UNL	70			74	47	09	08	35	14
08	22						62					
09	01						51					
09	04						43					
09	07	1	UNL	70			58	41	20	23	34	4
09	10	2	UNL	70			74	48	16	11	36	6
09	13	6	UNL	70			84	52	18	08	02	6
09	16	2	UNL	70			87	52	11	06	23	6
09	19	3	UNL	70			80	51	18	10	18	14
09	22						72					
10	01						60					
10	04						47					
10	07	0	UNL	70			61	43	18	20	36	4
10	10	0	UNL	70			82	52	19	09	17	10
10	13	0	UNL	70			91	56	23	08	14	14
10	16	0	UNL	70			92	56	23	08	20	17
10	19	0	UNL	70			84	54	24	11	18	16
10	22						77					
11	01						60					
11	04						50					
11	07	0	UNL	70			65	47	28	25	00	0
11	10	0	UNL	70			85	54	25	11	19	6
11	13	0	UNL	70			94	57	24	08	16	12
11	16	0	UNL	70			95	58	27	09	20	9
11	19	0	UNL	70			86	55	27	12	18	11
11	22						70					
12	01						61					
12	04						53					
12	07	0	UNL	70			69	51	36	30	06	5
12	10	0	UNL	70			88	56	29	12	16	9
12	13	0	UNL	70			96	59	28	09	26	18
12	16	0	UNL	70			93	58	31	11	21	12
12	19	0	UNL	70			87	57	34	15	25	12
12	22						76					
13	01						64					
13	04						58					
13	07	8	UNL	70			73	54	38	28	00	0
13	10	4	UNL	70			90	61	41	18	15	8
13	13	7	200	70			92	60	37	14	21	13
13	16	3	UNL	70			92	59	32	12	21	14
13	19	1	UNL	70			86	54	22	09	13	11
13	22						80					
14	01						70					
14	04						59					
14	07	0	UNL	70			68	47	22	17	01	3
14	10	0	UNL	70			83	50	05	05	29	3
14	13	0	UNL	70			90	53	08	04	19	8
14	16	0	UNL	70			91	54	12	05	26	12
14	19	5	UNL	70			81	50	11	07	26	15
14	22						68					
15	01						54					
15	04						47					
15	07	0	UNL	70			64	44	17	16	29	3
15	10	0	UNL	70			80	49	06	06	29	6
15	13	0	UNL	70			86	52	08	05	20	4
15	16	0	UNL	70			87	53	15	07	25	4
15	19	0	UNL	70			79	51	21	11	36	9
15	22						65					
16	01						58					
16	04						49					
16	07	0	UNL	70			64	46	27	25	24	4
16	10	0	UNL	70			78	50	18	10	30	5
16	13	0	UNL	70			85	53	18	08	28	8
16	16	2	UNL	70			84	53	20	09	27	15
16	19	8	250	70			75	50	22	14	27	18
16	22						65					
17	01						58					
17	04						60					
17	07	0	UNL	70			66	45	19	16	33	14
17	10	2	UNL	70			68	43	05	09	26	22
17	13	3	UNL	70			64	42	08	11	31	14
17	16	8	100	70			60	43	21	22	02	20
17	19	8	UNL	70			58	42	21	24	36	10
17	22						52					
18	01						48					
18	04						43					
18	07	0	UNL	70			55	43	29	37	01	13
18	10	0	UNL	70			61	44	25	25	34	8
18	13	1	UNL	70			68	46	22	17	34	7
18	16	3	UNL	70			73	48	20	13	30	9
18	19	2	UNL	70			71	50	30	22	34	15
18	22						60					
19	01						54					
19	04						49					
19	07	0	UNL	70			58	46	35	42	35	4
19	10	0	UNL	70			72	52	37	28	28	6
19	13	0	UNL	70			81	55	34	18	16	10
19	16	0	UNL	70			83	56	34	17	16	15
19	19	0	UNL	70			76	52	31	19	15	14
19	22						68					
20	01						57					
20	04						48					
20	07	0	UNL	70			61	45	28	29	01	4
20	10	0	UNL	70			79	54	32	18	14	8
20	13	0	UNL	70			85	54	25	11	17	18
20	16	1	UNL	70			87	55	24	10	15	12
20	19	0	UNL	70			80	52	24	13	15	18
20	22						71					
21	01						58					
21	04						53					
21	07	0	UNL	50			65	48	33	30	34	4
21	10	0	UNL	50			79	54	31	17	26	6
21	13	0	UNL	70			87	54	23	10	06	5
21	16	0	UNL	70			90	55	21	08	26	6
21	19	0	UNL	70			83	55	32	16	29	9
21	22						70					
22	01						60					
22	04						58					
22	07	0	UNL	70			69	49	30	23	32	10
22	10	0	UNL	70			83	53	24	11	30	7
22	13	0	UNL	70			90	57	28	11	19	7
22	16	1	UNL	70			92	57	26	09	28	7
22	19	0	UNL	70			86	55	28	12	16	10
22	22						74					
23	01						61					
23	04						56					
23	07	0	UNL	70			68	50	34	29	31	5
23	10	0	UNL	70			85	55	28	13	25	4
23	13	0	UNL	70			94	57	23	08	16	10
23	16	1	UNL	70			95	59	31	10	17	10
23	19	0	UNL	70			87	56	29	12	17	13
23	22						78					
24	01						63					
24	04						54					
24	07	0	UNL	70			69	52	38	34	04	5
24	10	0	UNL	70			87	58	40	19	18	11
24	13	0	UNL	70			96	60	33	11	16	11
24	16	1	UNL	70			95	60	34	12	15	17
24	19	0	UNL	70			87	58	36	16	16	15
24	22						74					
25	01						66					
25	04						59					
25	07	3	UNL	40			70	55	45	41	34	4
25	10	8	UNL	40			86	58	38	18	34	4
25	13	10	250	50			91	60	38	15	30	7
25	16	8	200	70			94	60	35	12	05	4
25	19	10	200	70			87	58	38	18	27	8
25	22						74					
26	01						64					
26	04						55					
26	07	7	UNL	70			69	52	38	32	02	3
26	10	8	UNL	70			87	57	34	15	26	4
26	13	10	UNL	70			98	60	32	10	18	8
26	16	6	UNL	70			97	60	31	10	18	7
26	19	9	UNL	70			89	57	31	12	27	9
26	22						75					
27	01						63					
27	04						57					
27	07	3	UNL	70			72	53	38	28	32	6
27	10	3	UNL	70			86	58	34	15	33	6
27	13	6	UNL	70			97	61	35	11	15	10
27	16	6	200	70			100	62	36	11	15	13
27	19	0	UNL	70			89	58	33	14	27	11
27	22						74					
28	01						62					
28	04						55					
28	07	6	250	70			69	51	35	30	36	4
28	10	4	UNL	70			88	58	34	15	29	6
28	13	4	UNL	70			99	61	33	10	15	16
28	16	6	200	70			98	62	36	11	25	8
28	19	9	220	70			89	58	36	15	29	9
28	22						74					
29	01						62					
29	04						56					
29	07	1	UNL	70			67	50	35	31	33	4
29	10	2	UNL	70			87	58	35	16	13	5
29	13	4	UNL	70			96	60	33	11	22	14
29	16	9	220	70			93	60	36	13	26	13
29	19	8	160	70			87	57	35	16	25	12
29	22						77					
30	01						68					
30	04						58					
30	07	0	UNL	70			69	50	33	26	31	5
30	10	0	UNL	70			85	56	33	15	35	4
30	13	0	UNL	70			93	58	27	09	14	6
30	16	0	UNL	70			95	57	21	07	13	9
30	19	0	UNL	70			87	55	27	11	27	10
30	22						71					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 79 06

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

FIRST CLASS

OBSERVATIONS AT 3-HOUR INTERVALS

February 1979

Day	Hour	Sky Cover Tenths	Ceiling Hnds. of Ft.	Visibility Whole Miles	Visibility Tenths Mile	Weather	Air °F	Wet Bulb °F	Dew Pt. °F	Rel. Hum. %	Wind Dir	Wind Speed Knots
01	01						14					
01	04						21					
01	07	10	2	0	4	F	20	20	20	100	36	5
01	10	10	8	2		F	22	21	19	88	32	3
01	13	8	50	50			31	26	22	69	26	4
01	16	4	UNL	35			32	26	23	69	20	7
01	19	9	30	20			24	23	20	85	29	5
01	22						18					
02	01						18					
02	04						19					
02	07	10	30	10		S	21	21	19	92	00	0
02	10	10	80	15		S	27	26	23	85	30	8
02	13	8	80	15			36	31	23	58	26	4
02	16	5	UNL	30			33	28	18	56	33	5
02	19						28					
02	22						19					
03	01						12					
03	04						09					
03	07	0	UNL	70			09	08	04	80	30	10
03	10	0	UNL	70			27	23	13	55	33	7
03	13	0	UNL	70			37	30	17	44	32	7
03	16	0	UNL	70			38	30	14	38	28	10
03	19						26					
03	22						19					
04	01						18					
04	04						22					
04	07	10	UNL	70			19	17	12	74	32	8
04	10	8	80	70			37	30	17	44	32	5
04	13	9	80	70			46	39	29	48	36	16
04	16	5	UNL	70			46	37	25	44	01	19
04	19						38					
04	22						35					
05	01						27					
05	04						26					
05	07	3	UNL	70			24	23	20	85	33	8
05	10	10	UNL	70			42	33	20	41	32	8
05	13	8	UNL	70			53	40	24	32	30	10
05	16	8	UNL	70			55	40	18	23	34	10
05	19						42					
05	22						41					
06	01						37					
06	04						39					
06	07	10	250	70			41	35	27	58	30	8
06	10	10	UNL	70			52	41	27	38	36	16
06	13	9	200	70			59	43	24	26	01	11
06	16	10	UNL	70			61	41	10	13	01	11
06	19	5	UNL	15			46	35	19	34	34	9
06	22						34					
07	01						28					
07	04						27					
07	07	10	200	70			28	26	22	78	01	7
07	10	10	UNL	70			45	36	22	40	01	4
07	13	10	UNL	70			58	41	16	19	33	4
07	16	10	200	70			62	43	19	19	14	4
07	19	8	UNL	15			45	38	31	58	18	5
07	22						32					
08	01						26					
08	04						23					
08	07	8	UNL	70			23	21	17	78	30	4
08	10	9	UNL	70			44	34	20	38	31	4
08	13	9	UNL	70			57	41	20	24	14	5
08	16	7	UNL	70			58	42	23	26	17	8
08	19	3	UNL	15			44	37	28	53	17	5
08	22						31					
09	01						28					
09	04						24					
09	07	0	UNL	70			25	23	19	78	35	5
09	10	0	UNL	70			45	37	27	49	02	5
09	13	2	UNL	70			57	41	21	25	18	4
09	16	3	UNL	70			60	42	18	19	17	7
09	19						40					
09	22						31					
10	01						28					
10	04						25					
10	07	10	UNL	70			28	24	20	78	30	4
10	10	10	150	70			41	36	26	51	32	3
10	13	10	UNL	70			53	40	22	30	12	4
10	16	7	200	70			58	43	26	29	20	8
10	19						45					
10	22						33					
11	01						29					
11	04						26					
11	07	2	UNL	70			25	25	22	88	29	7
11	10	10	220	70			44	37	27	51	00	0
11	13	10	220	70			50	38	26	38	15	7
11	16	10	220	70			59	41	18	20	18	8
11	19						38					
11	22						32					
12	01						28					
12	04						26					
12	07	7	200	70			27	26	24	88	28	7
12	10	10	100	70			43	37	28	56	27	8
12	13	10	200	70			55	43	29	37	11	7
12	16	3	UNL	70			62	44	23	22	18	9
12	19						40					
12	22						36					
13	01						32					
13	04						30					
13	07	8	80	50			51	39	25	36	23	5
13	10	10	80	30		RW	56	41	23	26	16	15
13	13	10	80	6			57	45	32	39	19	20
13	16	10	60	10		RW	52	44	37	57	14	14
13	19	10	41	10		R	47	45	42	83	16	18
13	22						42					
14	01						43					
14	04						43					
14	07	5	UNL	50			43	36	28	56	25	10
14	10	8	50	50			42	36	34	73	00	0
14	13	0	UNL	70			50	36	15	25	26	21
14	16	0	UNL	70			51	38	19	28	36	10
14	19	0	UNL	20			37	32	22	55	28	7
14	22						30					
15	01						27					
15	04						25					
15	07	0	UNL	70			24	23	19	81	32	4
15	10	0	UNL	70			41	33	22	47	02	4
15	13	0	UNL	70			50	37	15	25	11	6
15	16	0	UNL	70			54	40	22	28	19	7
15	19	0	UNL	20			39	34	27	62	20	5
15	22						33					
16	01						27					
16	04						25					
16	07	2	UNL	50			22	18	18	88	26	8
16	10	8	UNL	70			38	33	23	53	29	5
16	13	2	UNL	70			50	36	14	24	01	7
16	16	0	UNL	70			54	38	14	20	01	8
16	19						41					
16	22						33					
17	01						27					
17	04						22					
17	07	10	UNL	70			23	21	16	74	31	6
17	10	10	UNL	70			41	32	18	40	04	5
17	13	10	UNL	70			52	38	16	24	18	7
17	16	10	UNL	70			56	40	16	21	18	8
17	19						45					
17	22						32					
18	01						27					
18	04						24					
18	07	7	UNL	70			25	24	21	85	01	7
18	10	9	250	70			40	35	26	62	30	4
18	13	7	220	70			47	37	23	39	19	5
18	16	7	220	70			57	39	09	15	26	8
18	19						43					
18	22						37					
19	01						32					
19	04						33					
19	07	10	200	70			34	31	26	73	19	5
19	10	2	UNL	50			49	37	21	33	01	15
19	13	3	UNL	70			55	40	17	22	36	10
19	16	0	UNL	70			55	39	13	18	33	17
19	19						42					
19	22						33					
20	01						26					
20	04						22					
20	07	10	UNL	70			23	22	18	81	36	4
20	10	10	200	50			42	34	22	45	00	0
20	13	10	200	50			50	39	24	36	17	13
20	16	10	200	50			50	39	25	38	17	22
20	19	10	75	15			45	39	32	60	18	20
20	22						37					
21	01						35					
21	04						31					
21	07	1	UNL	35			31	31	30	96	21	4
21	10	10	80	30			37	34	31	79	16	4
21	13	10	12	7		S	35	35	35	100	17	15
21	16	5	UNL	10			40	37	35	82	18	7
21	19	3	UNL	15			33	33	32	96	15	3
21	22						29					
22	01						27					
22	04						26					
22	07	10	UNL	70			24	24	22	92	25	4
22	10	2	UNL	70			38	30	24	57	36	4
22	13	2	UNL	70			46	37	23	40	16	10
22	16	10	80	50			46	36	18	30	30	8
22	19	9	75	15			42	34	22	45	30	11
22	22						31					
23	01						28					
23	04						28					
23	07	3	UNL	50			31	28	23	72	12	3
23	10	3	UNL	50			42	33	17	36	32	7
23	13	3	UNL	50			46	34	08	20	01	18
23	16	7	120	70			46	34	09	20	34	15
23	19						38					
23	22						33					
24	01						25					
24	04						23					
24	07	10	UNL	70			22	21	17	81	32	4
24	10	7	UNL	70			41	33	22	47	00	0
24	13	10	250	70			52	38	18	26	18	13
24	16	10	UNL	70			55	40	19	24	16	12
24	19						47					
24	22						43					
25	01						39					
25	04						31					
25	07	3	250	70			29	27	24	82	34	8
25	10	9	250	70			45	35	24	47	01	4
25	13	6	140	70			54	41	25	33	17	9
25	16	8	UNL	70			56	41	23	28	15	6
25	19						47					
25	22						40					
26	01						31					
26	04						31					
26	07	1	UNL	70			32	29	21	64	33	6
26	10	1	UNL	70			48	37	21	34	02	5
26	13	10	60	50			53	38	14	21	29	12
26	16	6	70	7			53	36	05	14	36	24
26	19						41					
26	22						38					
27	01						34					
27	04						32					
27	07	4	UNL	70			25	23	17	72	31	8
27	10	2	UNL	70			45	34	17	32	10	3
27	13	8	UNL	70			55	38	10	16	16	5
27	16	7	UNL	70			60	39	03	10	23	4
27	19	3	UNL	20			44	33	13	28	17	5
27	22						38					
28	01						28					
28	04						26					
28	07	10	UNL	70			25	22	16	69	34	7
28	10	10	UNL	70			48	35	18	33	03	5
28	13	8	UNL	70			58	41	18	21	17	11
28	16	10	100	70			57	40	15	18	17	14
28	19	10	UNL	20			51	38	22	32	17	18
28	22						48					

NOTES

CEILING

UNL INDICATES UNLIMITED

WEATHER

- T TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 79 02

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

OBSERVATIONS AT 3-HOUR INTERVALS

March 1979

Day	Hour	Sky Cover (Tenths)	Ceiling (Hnds. of Ft.)	Visibility (Whole Miles / Tenths Mile)	Weather	Air °F	Wet Bulb °F	Dew Pt. °F	Rel. Hum. %	Wind Dir	Wind Speed Knots
01	01					40					
01	04					45					
01	07	6	80	30		38	33	25	57	21	9
01	10	10	80	50		48	39	26	41	12	17
01	13	10	200	35		49	38	23	36	02	13
01	16	3	UNL	35		50	35	06	16	33	14
01	19	8	85	20		41	30	08	25	34	11
01	22					35					
02	01					32					
02	04					29					
02	07	7	UNL	70		26	22	13	58	28	4
02	10	1	UNL	70		43	33	17	34	32	13
02	13	1	UNL	70		54	37	08	16	33	19
02	16	0	UNL	70		56	40	18	21	35	18
02	19					47					
02	22					44					
03	01					38					
03	04					29					
03	07	6	80	70		29	26	20	69	05	3
03	10	2	UNL	70		50	38	22	33	00	0
03	13	3	UNL	70		58	43	24	27	18	4
03	16	6	UNL	70		63	45	25	24	33	6
03	19					47					
03	22					45					
04	01					38					
04	04					35					
04	07	0	UNL	70		31	29	26	83	32	8
04	10	0	UNL	70		51	42	32	48	26	4
04	13	10	UNL	70		61	46	32	34	22	7
04	16	10	UNL	70		65	46	28	25	30	8
04	19					47					
04	22					38					
05	01					33					
05	04					33					
05	07	10	200	70		34	31	26	73	35	8
05	10	10	UNL	70		58	42	27	35	04	5
05	13	10	UNL	70		66	47	27	23	32	9
05	16	10	200	70		71	49	27	19	28	9
05	19					54					
05	22					50					
06	01					47					
06	04					37					
06	07	6	UNL	70		35	32	27	73	32	6
06	10	0	UNL	70		62	47	32	32	34	9
06	13	0	UNL	70		69	49	29	22	10	6
06	16	0	UNL	70		75	50	27	18	24	3
06	19	0	UNL	30		61	45	28	29	28	8
06	22					47					
07	01					42					
07	04					37					
07	07	0	UNL	70		35	32	28	78	36	5
07	10	0	UNL	70		62	47	31	31	05	4
07	13	0	UNL	70		70	50	30	23	13	4
07	16	1	UNL	70		75	50	24	15	30	5
07	19	0	UNL	30		61	45	28	29	02	4
07	22					46					
08	01					38					
08	04					37					
08	07	1	UNL	70		38	34	29	67	31	8
08	10	5	UNL	70		63	46	29	28	01	6
08	13	8	UNL	70		72	50	27	19	01	6
08	16	5	UNL	70		76	49	17	11	32	5
08	19	3	UNL	30		61	45	28	29	09	4
08	22					47					
09	01					46					
09	04					42					
09	07	0	UNL	70		41	36	30	65	29	8
09	10	0	UNL	70		63	47	32	31	26	6
09	13	1	UNL	70		70	50	30	23	22	4
09	16	2	UNL	70		74	49	23	15	23	5
09	19					65					
09	22					52					
10	01					46					
10	04					40					
10	07	0	UNL	70		38	32	26	67	30	6
10	10	0	UNL	70		61	45	27	27	00	0
10	13	0	UNL	70		71	49	26	19	17	17
10	16	0	UNL	70		72	48	21	14	18	15
10	19					61					
10	22					53					
11	01					41					
11	04					35					
11	07	7	UNL	70		33	30	24	70	31	5
11	10	8	UNL	70		58	43	24	26	05	4
11	13	10	UNL	70		69	47	20	15	27	7
11	16	10	250	70		69	45	13	11	24	8
11	19					56					
11	22					47					
12	01					38					
12	04					35					
12	07	0	UNL	70		33	30	24	70	00	0
12	10	0	UNL	70		61	43	20	20	29	3
12	13	2	UNL	70		58	46	20	16	18	8
12	16	10	UNL	70		70	45	12	10	20	9
12	19					58					
12	22					40					
13	01					38					
13	04					34					
13	07	8	250	70		37	31	21	52	17	7
13	10	3	UNL	70		60	43	23	24	29	5
13	13	10	250	70		66	44	14	13	03	6
13	16	10	250	50		67	44	12	12	13	11
13	19	10	250	30		57	43	27	32	12	11
13	22					49					
14	01					40					
14	04					38					
14	07	7	200	50		34	32	30	85	32	5
14	10	2	UNL	50		55	44	35	45	14	4
14	13	4	UNL	70		62	46	30	30	09	8
14	16	3	UNL	70		66	47	27	23	16	16
14	19	1	UNL	45		54	45	37	53	16	16
14	22					48					
15	01					47					
15	04					46					
15	07	10	120	15		46	42	38	74	16	15
15	10	10	120	30		54	46	38	55	17	22
15	13	10	200	30		60	46	33	36	17	26
15	16	10	22	10	RW	45	43	40	83	16	11
15	19	10	60	20		44	40	36	74	14	18
15	22					40					
16	01					34					
16	04					31					
16	07	4	UNL	70		29	28	27	92	28	6
16	10	10	120	50		46	33	08	21	34	14
16	13	8	150	50		47	34	09	21	02	12
16	16	8	200	50		54	38	12	19	12	5
16	19	10	200	15		46	34	13	26	02	3
16	22					40					
17	01					37					
17	04					37					
17	07	8	70	50		37	32	24	59	30	7
17	10	7	50	50		47	36	21	36	00	0
17	13	6	70	60		52	37	13	21	32	8
17	16	4	UNL	50		53	37	08	17	34	6
17	19	6	UNL	15		45	34	16	31	01	4
17	22					40					
18	01					30					
18	04					27					
18	07	10	95	70		31	28	22	69	35	4
18	10	10	100	50		46	37	26	46	13	9
18	13	10	70	50		54	40	22	29	17	14
18	16	4	UNL	50		53	40	23	31	14	18
18	19	5	UNL	30		47	37	23	38	14	15
18	22					41					
19	01					35					
19	04					33					
19	07	10	20	10	R	36	35	34	92	00	0
19	10	10	25	20		41	38	34	76	00	0
19	13	10	40	15		45	39	33	63	31	4
19	16	10	40	30		42	39	36	79	21	7
19	19	10	29	10	R	40	38	36	86	00	0
19	22					37					
20	01					38					
20	04					38					
20	07	10	80	7		39	35	35	100	34	4
20	10	10	90	15		44	38	32	63	09	3
20	13	9	200	50		48	40	30	50	09	8
20	16	10	200	50		47	40	33	58	34	8
20	19	8	200	30		43	39	35	73	02	3
20	22					38					
21	01					33					
21	04					35					
21	07	10	UNL	15		36	34	32	85	36	5
21	10	7	60	50		50	40	26	43	07	14
21	13	4	UNL	70		55	41	23	29	01	16
21	16	9	80	70		55	41	23	29	29	10
21	19	7	200	15		47	40	32	56	36	16
21	22					41					
22	01					33					
22	04					30					
22	07	8	100	50		34	32	29	82	30	4
22	10	5	UNL	50		47	39	30	52	24	4
22	13	8	250	50		56	43	30	37	15	15
22	16	4	UNL	50		57	43	27	32	15	19
22	19	1	UNL	20		48	41	31	50	14	17
22	22					44					
23	01					37					
23	04					30					
23	07	6	UNL	15		34	31	27	76	33	5
23	10	3	UNL	50		50	40	28	43	12	4
23	13	2	UNL	50		58	42	22	25	18	6
23	16	0	UNL	50		61	43	21	21	21	12
23	19	0	UNL	20		49	38	24	38	18	7
23	22					39					
24	01					33					
24	04					31					
24	07	0	UNL	50		35	31	26	70	33	5
24	10	0	UNL	50		55	41	24	30	25	3
24	13	0	UNL	50		64	44	20	18	06	6
24	16	0	UNL	70		66	46	21	18	27	7
24	19	0	UNL	20		54	41	25	33	17	7
24	22					44					
25	01					40					
25	04					38					
25	07	0	UNL	50		37	33	28	70	32	5
25	10	1	UNL	70		58	43	24	26	28	3
25	13	6	UNL	70		67	45	18	15	14	6
25	16	4	UNL	70		68	46	22	17	20	13
25	19	7	UNL	20		58	43	25	27	34	10
25	22					51					
26	01					46					
26	04					39					
26	07	10	200	70		36	33	27	65	30	6
26	10	10	200	70		58	43	27	31	10	5
26	13	10	200	70		65	44	15	14	18	18
26	16	10	90	50		63	44	21	20	18	10
26	19	10	65	20		58	44	32	40	30	10
26	22					53					
27	01					47					
27	04					42					
27	07	10	27	10	R	42	41	40	93	15	11
27	10	5	UNL	15		49	45	37	63	16	15
27	13	4	UNL	50		60	44	26	27	17	17
27	16	9	80	45		57	42	22	26	18	7
27	19	7	80	20		51	38	23	33	16	13
27	22					46					
28	01					43					
28	04					42					
28	07	10	35	15	RW	41	39	38	82	16	20
28	10	10	120	15		43	39	34	71	15	22
28	13	10	40	15	RW	44	40	35	71	16	14
28	16	10	90	15		51	40	26	38	01	7
28	19	7	UNL	15		45	34	17	32	34	14
28	22					37					
29	01					40					
29	04					37					
29	07	4	UNL	70		38	35	32	79	03	6
29	10	0	UNL	70		51	40	26	38	00	0
29	13	1	UNL	70		59	43	24	26	23	8
29	16	2	UNL	70		64	43	18	15	18	10
29	19	2	UNL	15		54	42	29	38	16	6
29	22					47					
30	01					38					
30	04					31					
30	07	0	UNL	70		33	30	25	72	01	7
30	10	0	UNL	70		52	41	27	38	29	4
30	13	1	UNL	70		60	41	14	16	25	8
30	16	3	UNL	70		59	40	10	14	34	16
30	19	1	UNL	15		51	38	20	29	35	12
30	22					42					
31	01					39					
31	04					35					
31	07	0	UNL	70		38	31	22	53	34	9
31	10	0	UNL	70		50	37	19	29	25	6
31	13	0	UNL	70		60	40	07	12	19	4
31	16	0	UNL	70		63	40	02	08	36	14
31	19	0	UNL	15		52	37	12	20	34	9
31	22					47					

NOTES

CEILING

UNL INDICATES UNLIMITED

WEATHER

- • TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS, INDICATED IN TENS OF DEGREES FROM TRUE NORTH: I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS: MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION

BISHOP CALIFORNIA

YEAR & MONTH

79 03

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

OBSERVATIONS AT 3-HOUR INTERVALS

April 1979

DAY 01

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						41					
04						35					
07	0	UNL	70			37	31	20	50	32	6
10	0	UNL	70			51	37	17	26	36	15
13	1	UNL	70			53	38	15	22	34	6
16	4	UNL	70			59	41	15	18	03	6
19	1	UNL	15			46	36	18	30	36	6
22						42					

DAY 02

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						41					
04						36					
07	0	UNL	70			39	31	18	43	28	7
10	0	UNL	70			50	35	13	23	31	7
13	0	UNL	70			58	40	12	16	35	10
16	0	UNL	15			62	40	08	12	32	24
19	0	UNL	15			52	37	13	21	34	20
22						47					

DAY 03

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						40					
04						37					
07	0	UNL	70			40	33	24	53	04	11
10	0	UNL	70			52	39	21	30	34	4
13	0	UNL	70			65	43	11	12	34	4
16	4	UNL	70			68	46	17	14	33	17
19	3	UNL	70			58	42	22	25	32	6
22						48					

DAY 04

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						38					
04						37					
07	0	UNL	70			41	34	25	53	35	5
10	0	UNL	70			61	44	24	24	02	4
13	0	UNL	70			70	47	19	14	05	7
16	0	UNL	70			72	48	21	14	21	6
19	0	UNL	70			62	44	23	22	16	6
22						55					

DAY 05

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						45					
04						37					
07	0	UNL	70			41	36	30	65	34	4
10	7	UNL	70			61	45	28	30	00	0
13	7	UNL	70			72	48	21	14	17	24
16	8	UNL	70			72	49	24	16	20	15
19	1	UNL	70			63	46	28	27	17	12
22						59					

DAY 06

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						54					
04						51					
07	5	UNL	70			57	42	24	28	20	10
10	6	UNL	70			63	42	12	13	23	8
13	4	UNL	70			69	44	05	08	25	18
16	3	UNL	70			70	44	03	07	22	18
19	7	180	70			62	41	08	12	26	13
22						51					

DAY 07

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						47					
04						45					
07	10	50	15			47	37	24	41	34	6
10	10	70	70			51	41	30	45	32	7
13	3	UNL	70			62	46	28	28	30	4
16	3	UNL	70			65	46	25	22	33	10
19	0	UNL	70			58	43	26	28	28	5
22						44					

DAY 08

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						41					
04						39					
07	0	UNL	70			44	37	27	51	34	7
10	0	UNL	70			63	45	25	24	32	3
13	0	UNL	70			74	49	22	14	18	7
16	0	UNL	70			76	49	20	12	17	6
19	8	UNL	70			67	47	25	20	27	9
22						56					

DAY 09

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						52					
04						45					
07	10	150	70			55	40	18	24	03	6
10	8	250	70			65	44	15	14	26	10
13	5	UNL	50			65	43	12	12	34	18
16	9	250	50			63	43	17	17	29	18
19	5	UNL	50			50	37	17	27	01	20
22						39					

DAY 10

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						37					
04						34					
07	3	UNL	50			38	29	13	38	38	24
10	1	UNL	70			46	33	09	22	07	26
13	1	UNL	50			51	36	12	21	36	34
16	1	UNL	50			57	40	14	18	01	24
19	0	UNL	70			52	38	16	24	36	14
22						45					

DAY 11

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						41					
04						44					
07	9	80	70			49	38	27	43	29	5
10	7	120	70			63	45	25	24	01	20
13	10	200	70			68	45	14	12	02	22
16	8	200	50			66	45	18	18	01	21
19	10	UNL	50			59	42	21	23	01	15
22						53					

DAY 12

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						49					
04						50					
07	2	UNL	70			50	40	28	43	02	10
10	4	UNL	70			63	46	27	26	01	16
13	8	UNL	70			70	47	21	16	34	8
16	8	UNL	70			74	49	21	14	23	5
19	8	UNL	15			65	46	24	21	16	12
22						55					

DAY 13

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						42					
04						38					
07	3	UNL	70			45	40	34	65	33	5
10	1	UNL	70			65	48	32	29	02	4
13	0	UNL	70			77	50	18	11	06	6
16	0	UNL	70			80	50	13	08	18	6
19	0	UNL	15			71	48	23	16	14	9
22						57					

DAY 14

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						48					
04						42					
07	0	UNL	70			48	39	29	48	33	8
10	0	UNL	70			69	48	27	21	29	5
13	0	UNL	70			77	51	25	14	18	12
16	0	UNL	70			79	51	21	11	16	15
19	0	UNL	15			70	49	29	22	16	3
22						57					

DAY 15

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						44					
04						38					
07	0	UNL	70			45	38	26	51	34	4
10	3	UNL	70			68	47	23	18	00	0
13	7	UNL	70			78	50	19	11	18	9
16	8	UNL	70			80	50	12	07	20	10
19	8	UNL	15			68	46	20	16	00	0
22						59					

DAY 16

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						45					
04						37					
07	10	UNL	70			43	34	20	40	01	3
10	10	UNL	70			63	43	17	17	18	6
13	4	UNL	40			77	49	12	08	21	20
16	6	180	15			73	47	12	09	24	20
19						54					
22						53					

DAY 17

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						45					
04						40					
07	0	UNL	70			46	36	22	39	03	6
10	1	UNL	70			57	39	11	16	36	6
13	0	UNL	70			62	41	09	12	35	14
16	1	UNL	70			58	40	11	15	26	20
19						49					
22						46					

DAY 18

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						39					
04						34					
07	0	UNL	70			38	29	11	33	28	8
10	8	UNL	70			51	35	06	16	22	6
13	7	UNL	70			56	37	-03	09	05	11
16	1	UNL	70			59	38	-06	07	08	6
19						48					
22						44					

DAY 19

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						40					
04						36					
07	0	UNL	70			40	32	20	45	34	8
10	0	UNL	70			52	38	18	26	01	6
13	8	UNL	70			62	42	14	15	20	11
16	1	UNL	70			65	43	12	12	17	15
19						57					
22						50					

DAY 20

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						37					
04						32					
07	6	UNL	40			41	36	30	65	02	4
10	7	250	40			58	41	18	21	27	3
13	3	UNL	70			69	46	19	15	15	7
16	6	UNL	70			71	46	13	11	17	7
19	10	200	70			62	44	22	21	08	4
22						54					

DAY 21

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						42					
04						38					
07	1	UNL	40			45	35	19	35	02	4
10	5	UNL	40			65	44	18	16	00	0
13	10	200	50			73	48	17	12	17	15
16	4	UNL	70			76	48	13	09	14	17
19	4	UNL	70			65	43	13	13	23	6
22						54					

DAY 22

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						48					
04						40					
07	3	UNL	40			45	34	17	32	36	3
10	2	UNL	40			67	44	13	12	18	15
13	1	UNL	70			73	48	17	12	20	18
16	0	UNL	70			74	47	09	08	19	10
19	5	UNL	70			62	42	10	13	32	7
22						56					

DAY 23

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						45					
04						47					
07	9	UNL	40			49	36	14	25	07	5
10	3	UNL	40			63	42	14	15	24	8
13	3	UNL	70			65	43	10	11	29	15
16	5	UNL	70			67	42	-02	06	24	9
19	4	UNL	70			58	39	02	10	26	7
22						49					

DAY 24

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						45					
04						40					
07	10	UNL	70			44	34	18	35	00	0
10	6	UNL	70			60	40	07	12	26	4
13	7	UNL	70			68	44	04	08	20	4
16	1	UNL	70			71	45	08	08	11	8
19	3	UNL	70			63	43	14	15	34	14
22						54					

DAY 25.

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01								46			
04						44					
07	9	120	70			50	39	26	38	30	6
10	9	250	70			60	42	18	19	03	8
13	8	UNL	70			70	46	15	12	10	4
16	10	100	70			71	49	26	19	16	4
19	10	100	70			65	49	34	32	34	4
22						64					

DAY 26

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						57					
04						54					
07	6	90	70			57	46	37	47	00	0
10	2	UNL	70			70	53	39	32	12	5
13	8	160	70			76	53	35	21	16	15
16	9	100	70			74	52	33	22	16	21
19	9	90	70			66	51	39	37	04	4
22						60					

DAY 27

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						48					
04						44					
07	0	UNL	70			52	41	29	41	01	5
10	1	UNL	70			68	47	25	20	12	5
13	0	UNL	70			77	48	08	07	02	3
16	0	UNL	70			77	48	05	06	10	4
19	0	UNL	70			67	45	14	13	34	6
22						54					

DAY 28

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						44					
04						48					
07	0	UNL	70			54	42	29	38	28	5
10	3	UNL	70			67	48	27	22	01	5
13	4	UNL	70			75	48	17	11	36	7
16	2	UNL	70			76	48	12	09	28	6
19	0	UNL	15			69	47	21	16	35	7
22						60					

DAY 29

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						50					
04						42					
07	9	UNL	70			53	39	20	27	35	5
10	8	UNL	70			69	46	18	14	26	4
13	10	UNL	70			80	51	20	11	16	8
16	10	250	70			80	52	22	12	18	10
19	9	UNL	15			71	49	26	19	26	10
22						60					

DAY 30

Hour	Sky cover (tenths)	Ceiling (hunds. of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Temp. air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01						49					
04						43					
07	6	UNL	70			55	42	28	36	32	5
10	7	UNL	70			71	47	17	13	27	6
13	8	UNL	70			78	49	12	08	23	10
16	3	UNL	70			78	50	19	11	29	18
19	0	UNL	15			68	47	24	19	34	9
22						55					

NOTES

CEILING

UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 79 04

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

FIRST CLASS

May 1979

OBSERVATIONS AT 3-HOUR INTERVALS

Day	Hour	Sky cover (tenths)	Ceiling (hnds of ft.)	Visibility whole miles	Visibility 16ths mile	Weather	Air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
01	01						51					
01	04						48					
01	07	0	UNL	70			58	43	24	26	35	18
01	10	0	UNL	70			66	44	14	13	28	8
01	13	3	UNL	70			74	47	10	08	36	9
01	16	8	200	40			69	46	17	14	34	15
01	19	10	140	15			55	44	32	42	33	14
01	22						56					
02	01						51					
02	04						48					
02	07	10	70	70		R	53	46	40	62	03	17
02	10	8	70	50			63	46	37	38	36	7
02	13	5	UNL	50			71	50	30	22	34	15
02	16	2	UNL	50			73	50	28	18	36	15
02	19	0	UNL	15			67	48	29	24	34	8
02	22						59					
03	01						50					
03	04						47					
03	07	7	UNL	70			52	42	32	47	30	8
03	10	0	UNL	70			70	46	30	25	30	7
03	13	3	UNL	70			71	50	22	13	34	3
03	16	3	UNL	70			82	52	22	11	20	10
03	19	4	UNL	70			74	50	26	17	18	10
03	22						63					
04	01						51					
04	04						45					
04	07	10	250	70			55	46	37	51	36	4
04	10	10	200	70			71	52	38	28	24	8
04	13	10	160	50			78	53	28	15	16	10
04	16	9	160	50			80	53	26	14	15	15
04	19	9	180	70			75	47	09	09	26	11
04	22						65					
05	01						48					
05	04						42					
05	07	10	220	70			51	39	22	32	06	4
05	10	9	220	70			77	48	07	07	16	8
05	13	6	160	70			78	51	22	12	30	20
05	16	4	UNL	70			73	48	21	14	25	38
05	19	6	160	70			67	45	15	13	34	8
05	22						66					
06	01						52					
06	04						46					
06	07	10	200	70			55	42	26	33	15	4
06	10	5	UNL	70			70	46	14	11	01	13
06	13	6	220	70			73	46	05	07	02	16
06	16	7	200	70			70	46	16	13	35	18
06	19	2	UNL	70			56	41	18	21	02	13
06	22						47					
07	01						43					
07	04						43					
07	07	8	UNL	70			53	40	24	32	18	3
07	10	7	90	70			64	43	13	14	26	17
07	13	5	UNL	70			65	43	11	12	23	22
07	16	7	80	70			61	42	14	16	25	20
07	19	8	200	50			51	37	17	28	33	7
07	22						48					
08	01						43					
08	04						37					
08	07	10	80	70			45	33	11	25	01	15
08	10	10	80	70			49	36	16	27	02	16
08	13	8	80	50		T	47	38	25	42	02	15
08	16	9	80	70			48	38	28	41	34	18
08	19	9	80	30			43	37	30	60	28	8
08	22						45					
09	01						35					
09	04						36					
09	07	8	80	70			46	36	23	40	01	15
09	10	7	80	70			52	38	17	25	33	16
09	13	9	UNL	70			58	41	13	16	35	16
09	16	4	UNL	50			58	42	19	21	34	17
09	19	2	UNL	70			53	40	24	32	35	13
09	22						46					
10	01						38					
10	04						37					
10	07	0	UNL	70			50	39	24	36	01	10
10	10	0	UNL	70			61	44	25	25	02	10
10	13	0	UNL	70			64	44	18	17	32	5
10	16	0	UNL	70			70	46	13	11	29	10
10	19	0	UNL	70			64	43	13	14	35	7
10	22						57					
11	01						49					
11	04						41					
11	07	0	UNL	70			51	40	25	36	35	3
11	10	0	UNL	70			67	46	20	17	28	5
11	13	0	UNL	70			75	49	17	11	10	6
11	16	0	UNL	70			80	51	20	11	23	5
11	19	0	UNL	70			71	47	18	13	00	0
11	22						58					
12	01						52					
12	04						44					
12	07	0	UNL	70			55	42	26	33	32	9
12	10	0	UNL	70			72	48	21	14	20	5
12	13	0	UNL	70			78	50	16	09	25	7
12	16	0	UNL	70			83	51	13	07	22	10
12	19	0	UNL	70			74	47	12	08	18	11
12	22						61					
13	01						47					
13	04						43					
13	07	0	UNL	70			57	42	24	28	32	5
13	10	0	UNL	70			74	48	22	14	00	0
13	13	0	UNL	70			85	51	08	05	20	10
13	16	0	UNL	70			85	51	09	05	21	9
13	19	0	UNL	70			74	48	18	11	16	9
13	22						64					
14	01						48					
14	04						43					
14	07	0	UNL	70			55	41	25	28	33	4
14	10	0	UNL	70			76	48	11	08	17	5
14	13	0	UNL	70			83	50	04	05	13	5
14	16	0	UNL	70			86	52	13	06	18	13
14	19	0	UNL	70			78	50	24	14	25	10
14	22						62					
15	01						52					
15	04						47					
15	07	5	UNL	70			58	44	29	33	06	4
15	10	2	UNL	70			78	51	24	13	18	12
15	13	1	UNL	90			85	53	19	08	17	18
15	16	3	UNL	90			85	53	18	08	16	14
15	19	3	UNL	90			75	50	23	14	15	11
15	22						64					
16	01						53					
16	04						46					
16	07	0	UNL	70			57	46	34	42	32	5
16	10	0	UNL	70			78	52	29	16	00	0
16	13	2	UNL	70			82	52	20	10	18	6
16	16	2	UNL	70			84	52	17	08	21	8
16	19	2	UNL	70			76	50	22	13	35	6
16	22						61					
17	01						51					
17	04						46					
17	07	0	UNL	70			63	48	35	35	30	4
17	10	0	UNL	70			77	52	29	17	16	4
17	13	1	UNL	70			83	53	24	11	27	8
17	16	1	UNL	70			86	53	19	08	17	7
17	19	7	UNL	70			78	50	23	14	16	6
17	22						69					
18	01						58					
18	04						51					
18	07	0	UNL	70			69	48	26	20	32	11
18	10	0	UNL	70			79	51	24	13	03	11
18	13	0	UNL	70			86	55	25	10	29	4
18	16	0	UNL	70			89	56	24	09	22	3
18	19	0	UNL	70			82	53	25	12	34	10
18	22						68					
19	01						56					
19	04						51					
19	07	0	UNL	70			66	49	32	28	32	8
19	10	0	UNL	70			82	54	30	15	35	7
19	13	0	UNL	70			87	55	26	11	35	11
19	16	2	UNL	70			88	55	23	09	35	8
19	19	1	UNL	70			81	53	26	13	35	13
19	22						70					
20	01						58					
20	04						52					
20	07	0	UNL	70			67	47	28	23	33	5
20	10	0	UNL	70			82	53	26	13	21	8
20	13	0	UNL	70			89	55	23	08	21	9
20	16	1	UNL	70			92	55	17	06	28	8
20	19	2	UNL	70			83	55	30	15	18	8
20	22						72					
21	01						58					
21	04						52					
21	07	0	UNL	70			65	49	31	28	32	8
21	10	0	UNL	70			83	56	36	18	36	8
21	13	2	UNL	70			91	56	24	09	08	8
21	16	3	UNL	70			82	57	26	09	19	11
21	19	3	UNL	70			82	56	36	19	16	15
21	22						73					
22	01						69					
22	04						58					
22	07	10	UNL	40			66	50	36	33	30	3
22	10	10	UNL	40			84	56	34	17	18	10
22	13	8	250	70			87	55	24	10	17	10
22	16	9	250	70			88	55	24	10	14	13
22	19	10	200	70			80	53	26	14	18	12
22	22						74					
23	01						66					
23	04						62					
23	07	10	250	70			69	52	38	32	34	10
23	10	10	200	70			77	53	32	19	30	7
23	13	9	200	70			83	54	27	13	30	7
23	16	9	200	70			82	53	25	12	24	16
23	19	6					71					
23	22						65					
24	01						60					
24	04						54					
24	07	7	200	70			65	50	37	36	01	12
24	10	4	UNL	70			75	55	38	24	35	10
24	13	9	100	70			72	53	38	29	27	18
24	16	8	100	70			79	54	35	18	02	11
24	19	7	100	50			72	53	37	28	18	4
24	22						65					
25	01						59					
25	04						55					
25	07	0	UNL	70			65	51	38	37	35	9
25	10	1	UNL	70			77	55	38	25	17	3
25	13	4	UNL	70			83	57	37	19	35	8
25	16	8	100	70			85	57	35	17	15	4
25	19	1	UNL	70			78	58	41	27	08	4
25	22						66					
26	01						59					
26	04						55					
26	07	0	UNL	70			70	53	38	31	36	6
26	10	1	UNL	70			83	56	36	20	12	6
26	13	3	UNL	70			90	58	33	13	09	7
26	16	6	100	70			92	59	32	12	25	10
26	19	9	100	60			86	57	32	14	36	8
26	22						73					
27	01						62					
27	04						57					
27	07	0	UNL	70			66	53	43	43	31	4
27	10	3	UNL	50			85	60	42	22	17	15
27	13	9	250	50			92	60	37	14	15	17
27	16	4	UNL	50			91	56	23	08	24	10
27	19	2					77					
27	22						67					
28	01						56					
28	04						48					
28	07	0	UNL	70			65	46	32	29	00	0
28	10	0	UNL	70			77	52	29	17	22	6
28	13	2	UNL	50			87	55	27	11	17	21
28	16	4	UNL	50			86	57	33	15	18	20
28	19	2					77					
28	22						66					
29	01						57					
29	04						51					
29	07	0	UNL	70			54	36	20	26	36	20
29	10	0	UNL	70			64	44	18	17	01	14
29	13	0	UNL	70			71	47	19	14	27	8
29	16	0	UNL	70			75	50	25	14	32	8
29	19	0					68					
29	22						61					
30	01						56					
30	04						51					
30	07	0	UNL	70			61	41	11	14	36	14
30	10	0	UNL	70			71	49	25	18	36	17
30	13	2	UNL	70			77	48	12	08	03	9
30	16	2	UNL	70			79	48	09	06	34	10
30	19	1					69					
30	22						61					
31	01						51					
31	04						46					
31	07	0	UNL	70			57	41	20	24	00	0
31	10	5	UNL	70			70	46	17	13	28	4
31	13	9	UNL	70			78	49	14	09	26	8
31	16	4	UNL	70			80	51	19	10	28	8
31	19	2	UNL	70			72	48	26	18	13	5
31	22						60					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH: I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS: MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION
BISHOP CALIFORNIA

YEAR & MONTH
79 05

AN EQUAL OPPORTUNITY EMPLOYER

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

OBSERVATIONS AT 3-HOUR INTERVALS — June 1979

DAY 01
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						54					
04						49					
07	1	UNL	70			63	44	21	20	31	5
10	0	UNL	70			76	49	17	11	26	5
13	0	UNL	70			81	51	17	09	22	4
16	1	UNL	70			84	52	16	08	20	8
19	3	UNL	70			78	49	12	08	10	7
22						64					

DAY 02
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						51					
04						48					
07	0	UNL	70			64	45	24	22	29	6
10	0	UNL	70			78	50	20	11	32	5
13	0	UNL	70			84	52	17	08	32	5
16	0	UNL	70			87	53	15	07	27	7
19	0	UNL	70			80	51	18	10	16	9
22						69					

DAY 03
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						59					
04						50					
07	0	UNL	70			65	45	23	20	33	5
10	0	UNL	70			80	52	25	13	15	8
13	1	UNL	70			88	54	18	08	20	8
16	1	UNL	70			89	54	14	06	26	6
19	2	UNL	70			81	53	27	14	16	6
22						70					

DAY 04
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						56					
04						53					
07	1	UNL	70			67	50	34	30	32	6
10	1	UNL	70			85	57	36	17	25	5
13	10	100	50			91	58	32	12	32	6
16	10	100	70			88	57	36	17	33	11
19	8					76					
22						66					

DAY 05
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						59					
04						54					
07	7	UNL	70			70	53	40	34	32	4
10	1	UNL	70			85	58	39	20	23	5
13	1	UNL	70			94	59	33	12	24	7
16	1	UNL	70			96	59	30	10	24	11
19	0					86					
22						79					

DAY 06
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						68					
04						60					
07	0	UNL	70			70	53	40	34	00	0
10	0	UNL	70			89	56	35	10	04	3
13	0	UNL	70			96	57	19	06	33	14
16	0	UNL	70			93	57	25	09	25	14
19	0					80					
22						73					

DAY 07
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						66					
04						61					
07	0	UNL	40			62	44	23	22	36	21
10	0	UNL	20			69	47	22	17	36	21
13	1	UNL	20			78	49	17	11	35	20
16	3	UNL	20			73	47	13	10	36	25
19	0					63					
22						51					

DAY 08
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						48					
04						40					
07	0	UNL	70			58	40	18	21	32	3
10	0	UNL	70			66	44	15	14	27	6
13	0	UNL	70			75	48	14	10	30	8
16	0	UNL	70			81	51	17	09	01	13
19	0	UNL	70			74	47	09	08	35	14
22						62					

DAY 09
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						51					
04						43					
07	1	UNL	70			58	41	20	23	34	4
10	2	UNL	70			74	46	16	11	36	8
13	6	UNL	70			84	52	16	08	02	6
16	2	UNL	70			87	52	11	06	23	6
19	3	UNL	70			80	51	16	10	16	14
22						72					

DAY 10
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						60					
04						47					
07	0	UNL	70			61	43	19	20	36	4
10	0	UNL	70			82	52	19	09	17	10
13	0	UNL	70			91	56	23	08	14	14
16	0	UNL	70			82	56	23	08	20	17
19	0	UNL	70			84	54	24	11	18	16
22						77					

DAY 11
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						60					
04						50					
07	0	UNL	70			65	47	28	25	00	0
10	0	UNL	70			85	54	25	11	19	8
13	0	UNL	70			94	57	24	08	16	12
16	0	UNL	70			95	58	27	09	20	9
19	0	UNL	70			86	55	27	12	18	11
22						70					

DAY 12
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						61					
04						53					
07	0	UNL	70			69	51	36	30	06	5
10	0	UNL	70			88	56	29	12	18	9
13	0	UNL	70			96	59	28	09	26	18
16	0	UNL	70			93	58	31	11	21	12
19	0	UNL	70			87	57	34	15	25	12
22						76					

DAY 13
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						64					
04						58					
07	8	UNL	70			73	54	38	28	00	0
10	4	UNL	70			80	61	41	18	15	8
13	7	200	70			92	60	37	14	21	13
16	3	UNL	70			97	59	32	12	21	14
19	1	UNL	70			86	54	22	09	13	11
22						80					

DAY 14
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						70					
04						59					
07	0	UNL	70			68	47	22	17	01	3
10	0	UNL	70			83	50	05	05	29	3
13	0	UNL	70			90	53	08	04	19	8
16	0	UNL	70			91	54	12	05	28	12
19	5	UNL	70			81	50	11	07	26	15
22						66					

DAY 15
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						54					
04						47					
07	0	UNL	70			64	44	17	18	29	3
10	0	UNL	70			80	49	06	06	29	8
13	0	UNL	70			86	52	08	05	20	4
16	0	UNL	70			87	53	15	07	25	4
19	0	UNL	70			78	51	21	11	36	9
22						65					

DAY 16
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						58					
04						49					
07	0	UNL	70			64	46	27	25	24	4
10	0	UNL	70			78	50	18	10	30	5
13	0	UNL	70			85	53	18	08	28	6
16	2	UNL	70			84	53	20	09	27	15
19	8	250	70			75	50	22	14	27	18
22						65					

DAY 17
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						58					
04						60					
07	0	UNL	70			66	45	19	18	33	14
10	2	UNL	70			68	43	05	09	26	22
13	3	UNL	70			64	42	08	11	31	14
16	8	100	70			60	43	21	22	02	20
19	8	UNL	70			58	42	21	24	36	10
22						52					

DAY 18
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						48					
04						43					
07	0	UNL	70			55	43	29	37	01	13
10	0	UNL	70			61	44	25	25	34	6
13	1	UNL	70			68	46	22	17	34	7
16	3	UNL	70			73	48	20	13	30	9
19	2	UNL	70			71	50	30	22	34	15
22						60					

DAY 19
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						54					
04						49					
07	0	UNL	70			58	46	35	42	35	4
10	0	UNL	70			72	52	37	28	28	6
13	0	UNL	70			81	55	34	18	16	10
16	0	UNL	70			83	56	34	17	16	15
19	0	UNL	70			76	57	31	19	15	14
22						68					

DAY 20
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						57					
04						49					
07	0	UNL	70			61	45	28	29	01	4
10	0	UNL	70			79	54	32	19	14	8
13	0	UNL	70			85	54	25	11	17	18
16	1	UNL	70			87	55	24	10	15	12
19	0	UNL	70			80	52	24	13	15	18
22						71					

DAY 21
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						58					
04						53					
07	0	UNL	50			65	48	33	30	34	4
10	0	UNL	50			79	54	31	17	28	6
13	0	UNL	70			87	54	23	10	08	5
16	0	UNL	70			90	55	21	08	26	6
19	0	UNL	70			83	55	32	16	29	9
22						70					

DAY 22
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						60					
04						58					
07	0	UNL	70			69	49	30	23	32	10
10	0	UNL	70			83	53	24	11	30	7
13	0	UNL	70			90	57	28	11	19	7
16	1	UNL	70			82	57	26	09	28	7
19	0	UNL	70			88	55	28	12	18	10
22						74					

DAY 23
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						61					
04						56					
07	0	UNL	70			68	50	34	29	31	5
10	0	UNL	70			85	55	28	13	25	4
13	0	UNL	70			94	57	23	08	16	10
16	1	UNL	70			95	59	31	10	17	10
19	0	UNL	70			87	58	29	12	17	13
22						78					

DAY 24
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						63					
04						54					
07	0	UNL	70			69	52	39	34	04	5
10	0	UNL	70			87	59	40	19	18	11
13	0	UNL	70			96	60	33	11	16	11
16	1	UNL	70			95	60	34	12	15	17
19	0	UNL	70			97	58	36	18	18	15
22						74					

DAY 25
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						66					
04						59					
07	3	UNL	40			70	55	45	41	34	4
10	8	UNL	40			86	58	38	18	34	4
13	10	250	50			91	60	38	15	30	7
16	8	200	70			94	60	35	12	06	4
19	10	200	70			87	58	36	18	27	8
22						74					

DAY 26
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						64					
04						55					
07	7	UNL	70			69	52	38	32	02	3
10	8	UNL	70			87	57	34	15	28	4
13	10	UNL	70			98	60	32	10	18	8
16	6	UNL	70			97	60	31	10	18	7
19	8	UNL	70			89	57	31	12	27	9
22						75					

DAY 27
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						63					
04						57					
07	3	UNL	70			72	53	38	29	32	5
10	3	UNL	70			88	56	34	15	33	6
13	6	UNL	70			97	61	35	11	15	10
16	6	200	70			100	62	36	11	15	13
19	0	UNL	70			89	58	35	14	27	11
22						74					

DAY 28
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						62					
04						55					
07	6	250	70			69	51	36	30	36	4
10	4	UNL	70			88	58	34	15	29	6
13	4	UNL	70			99	61	33	10	15	16
16	6	200	70			99	62	36	11	25	8
19	9	220	70			89	58	36	15	29	9
22						74					

DAY 29
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						62					
04						56					
07	1	UNL	70			67	50	35	31	33	4
10	2	UNL	70			87	58	35	16	13	5
13	4	UNL	70			96	60	33	11	22	14
16	9	220	70			93	60	36	13	26	13
19	6	160	70			87	57	35	16	25	12
22						77					

DAY 30
HOUR	SKY COVER (TENTHS)	CEILING (HUNDS OF FT)	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMP AIR °F	WET BULB °F	DEW PT °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
01						60					
04						58					
07	0	UNL	70			69	50	33	26	31	5
10	0	UNL	70			85	56	33	15	35	4
13	0	UNL	70			93	58	27	09	14	6
16	0	UNL	70			95	57	21	07	13	9
19	0	UNL	70			87	55	27	11	27	10
22						71					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER
- T TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND
DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH: I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 79 06

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

U.S. MAIL

FIRST CLASS

OBSERVATIONS AT 3-HOUR INTERVALS

Columns: HOUR | SKY COVER TENTHS | CEILING HNDS. OF FT. | VISIBILITY WHOLE MILES | VISIBILITY 16THS MILE | WEATHER | TEMPERATURE AIR °F | WET BULB °F | DEW PT. °F | REL. HUM. % | WIND DIR | WIND SPEED KNOTS

DAY 01

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						60					
04						54					
07	0	UNL	70			68	51	36	31	29	5
10	0	UNL	70			84	56	32	15	06	7
13	0	UNL	70			90	58	33	13	17	13
16	1	UNL	70			81	59	35	14	15	20
19	0	UNL	70			85	58	38	20	20	6
22						74					

DAY 02

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						60					
04						50					
07	0	UNL	70			63	46	36	37	00	0
10	0	UNL	50			77	53	33	20	01	4
13	0	UNL	50			86	57	32	14	16	18
16	2	UNL	40			86	57	34	16	16	20
19	0	UNL	40			78	54	35	21	15	16
22						71					

DAY 03

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						63					
04						59					
07	0	UNL	50			63	49	38	40	30	4
10	0	UNL	50			78	55	38	24	16	13
13	3	UNL	50			84	56	34	17	18	14
16	4	UNL	30			84	58	38	19	16	22
19	3	UNL	70			78	57	42	28	15	13
22						71					

DAY 04

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						62					
04						53					
07	0	UNL	50			63	51	42	46	36	3
10	0	UNL	50			80	58	44	28	16	17
13	3	UNL	70			86	58	36	17	17	19
16	3	UNL	70			86	57	33	15	16	22
19	6	170	70			80	55	35	20	17	22
22						74					

DAY 05

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						67					
04						56					
07	9	UNL	70			64	50	38	38	34	4
10	9	250	70			77	54	36	23	17	8
13	2	UNL	70			85	56	34	16	17	20
16	4	UNL	70			87	58	35	16	16	18
19	1	UNL	70			80	54	33	18	16	18
22						71					

DAY 06

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						67					
04						54					
07	0	UNL	70			64	51	40	42	01	5
10	0	UNL	70			79	56	40	25	34	6
13	0	UNL	70			85	58	36	17	18	19
16	0	UNL	70			89	58	34	14	18	18
19	0	UNL	70			83	56	35	18	15	11
22						70					

DAY 07

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						60					
04						51					
07	0	UNL	70			64	46	33	32	05	4
10	2	UNL	70			78	54	34	20	23	4
13	10	UNL	70			90	58	32	13	17	20
16	10	UNL	70			92	58	29	10	15	20
19	5	UNL	70			85	55	28	13	30	6
22						70					

DAY 08

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						61					
04						51					
07	0	UNL	70			64	46	26	24	34	5
10	0	UNL	70			84	53	22	10	16	4
13	2	UNL	70			92	55	12	05	13	6
16	6	UNL	70			95	55	08	04	14	6
19	10	150	70			89	54	16	07	15	10
22						77					

DAY 09

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						62					
04						53					
07	3	UNL	70			64	46	27	25	02	3
10	1	UNL	70			91	55	20	07	15	15
13	1	UNL	70			100	57	13	04	18	18
16	6	UNL	70			95	57	22	07	22	10
19	4					87					
22						79					

DAY 10

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						61					
04						58					
07	0	UNL	70			70	48	24	18	35	5
10	0	UNL	70			87	53	16	07	34	4
13	0	UNL	70			97	58	22	07	05	8
16	0	UNL	70			97	58	22	07	27	6
19						84					
22						72					

DAY 11

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						66					
04						61					
07	8	UNL	70			72	53	38	29	29	11
10	3	UNL	70			87	56	29	12	01	6
13	7	UNL	70			92	56	22	08	03	4
16	7	UNL	70			97	58	24	07	29	5
19	7					88					
22						81					

DAY 12

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						76					
04						69					
07	0	UNL	70			76	56	42	30	36	11
10	0	UNL	70			85	58	38	19	11	5
13	0	UNL	70			93	60	36	13	24	5
16	0	UNL	70			98	60	31	09	27	7
19						92					
22						82					

DAY 13

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						76					
04						67					
07	0	UNL	70			75	55	40	28	30	10
10	0	UNL	70			87	58	37	17	23	5
13	0	UNL	70			100	61	33	10	18	12
16	0	UNL	70			101	62	34	10	15	10
19	0	UNL	70			93	59	36	13	16	12
22						84					

DAY 14

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						73					
04						67					
07	0	UNL	70			76	55	40	27	00	0
10	0	UNL	70			92	60	38	15	22	5
13	1	UNL	70			98	61	34	10	16	10
16	2	UNL	70			101	61	30	08	18	14
19	3	UNL	70			90	58	33	13	17	15
22						79					

DAY 15

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						69					
04						62					
07	0	UNL	70			72	56	43	35	32	3
10	0	UNL	70			90	61	42	19	27	5
13	0	UNL	70			100	60	28	08	17	14
16	2	UNL	70			101	61	29	08	18	12
19	3	UNL	70			93	59	35	13	17	16
22						81					

DAY 16

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						68					
04						62					
07	0	UNL	70			75	55	39	27	00	0
10	0	UNL	70			88	60	40	18	03	7
13	0	UNL	70			100	58	23	06	13	7
16	0	UNL	70			101	59	21	06	30	7
19	0	UNL	70			92	58	30	11	27	11
22						77					

DAY 17

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						68					
04						60					
07	0	UNL	70			73	53	37	27	05	5
10	0	UNL	70			93	58	33	12	24	7
13	1	UNL	70			102	60	25	06	23	5
16	2	UNL	70			104	60	23	06	27	8
19	0					90					
22						82					

DAY 18

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						70					
04						65					
07	0	UNL	70			76	55	39	26	34	5
10	0	UNL	70			95	60	34	12	27	6
13	3	UNL	70			104	61	26	06	24	8
16	10	120	20			89	59	38	17	27	28
19	10					79					
22						76					

DAY 19

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						69					
04						63					
07	0	UNL	30			73	55	41	32	35	4
10	3	UNL	30			88	62	46	23	32	6
13	10	110	30		T	94	62	42	16	28	13
16	10	150	50			87	61	44	22	29	8
19	10					80					
22						78					

DAY 20

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						71					
04						68					
07	10	120	50			68	58	53	69	31	4
10	10	120	50		RW	76	61	52	43	12	6
13	10	100	30		RW	75	62	56	52	07	7
16	10	80	30			74	62	56	54	01	11
19	10					66					
22						64					

DAY 21

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						63					
04						62					
07	7	140	70			64	61	59	84	33	4
10	10	100	70			74	64	59	60	29	6
13	9	120	50			80	62	52	38	22	5
16	10	90	70			83	61	48	30	33	7
19	10	90	70			78	60	49	36	01	9
22						72					

DAY 22

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						64					
04						62					
07	10	90	70			67	56	50	55	00	0
10	3	UNL	70			82	61	49	32	34	6
13	3	UNL	70			89	62	46	23	32	3
16	10	120	70			86	60	43	22	25	9
19	6	100	70			82	61	49	32	16	5
22						75					

DAY 23

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						65					
04						62					
07	7	UNL	70			70	58	50	49	34	6
10	7	UNL	70			86	62	49	28	26	5
13	8	UNL	70			93	62	42	17	35	8
16	4	UNL	50			96	62	40	14	27	8
19	6	200	50			91	62	44	20	00	0
22						80					

DAY 24

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						72					
04						65					
07	6	UNL	70			74	56	44	34	30	6
10	3	UNL	70			91	59	37	15	36	4
13	3	UNL	70			97	62	40	14	09	7
16	9	100	50			100	63	38	12	18	12
19	9	100	50			90	60	40	17	14	13
22						78					

DAY 25

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						69					
04						63					
07	0	UNL	70			73	56	45	37	33	4
10	0	UNL	70			92	62	43	18	00	0
13	8	100	70			97	62	40	14	16	13
16	4	UNL	70			98	63	40	13	17	14
19	2	UNL	70			90	58	32	13	31	8
22						72					

DAY 26

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						65					
04						58					
07	0	UNL	70			72	54	41	33	03	3
10	0	UNL	70			90	60	39	17	17	4
13	1	UNL	70			98	62	36	11	16	20
16	5	UNL	70			99	62	35	11	15	10
19	0	UNL	70			90	59	36	15	15	4
22						75					

DAY 27

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						65					
04						55					
07	0	UNL	70			72	51	32	23	34	5
10	0	UNL	70			86	57	34	16	25	6
13	0	UNL	70			94	57	23	08	28	6
16	0	UNL	70			98	58	22	06	24	9
19	0	UNL	70			86	56	31	14	22	4
22						74					

DAY 28

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						62					
04						57					
07	0	UNL	70			71	53	39	31	00	0
10	0	UNL	70			87	58	36	16	00	0
13	0	UNL	70			97	59	27	08	21	8
16	0	UNL	70			99	60	29	08	22	6
19	0	UNL	70			91	57	28	10	14	16
22						77					

DAY 29

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						66					
04						60					
07	0	UNL	70			71	52	35	27	32	6
10	0	UNL	70			88	55	23	09	25	5
13	0	UNL	70			99	59	25	07	15	7
16	0	UNL	70			102	60	25	06	18	6
19	0	UNL	70			91	57	27	10	25	16
22						80					

DAY 30

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						65					
04						62					
07	0	UNL	70			72	52	36	27	32	5
10	0	UNL	50			90	58	33	13	15	6
13	0	UNL	50			100	60	26	07	15	14
16	0	UNL	70			101	60	25	07	15	7
19	0					88					
22						81					

DAY 31

HOUR	SKY	CEIL	VIS WHOLE	VIS 16THS	WEATHER	AIR	WET BULB	DEW PT	RH	DIR	SPEED
01						66					
04						56					
07	0	UNL	70			71	49	27	19	01	4
10	0	UNL	70			88	55	23	09	12	3
13	0	UNL	70			100	59	20	05	33	5
16	0	UNL	70			103	60	24	06	22	4
19	0					92					
22						81					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 79 07

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

OBSERVATIONS AT 3-HOUR INTERVALS AUGUST 1979

Day	Hour	Sky cover tenths	Ceiling hnds. of ft.	Visibility whole miles	Visibility 16ths mile	Weather	Air °F	Wet bulb °F	Dew pt. °F	Rel. hum. %	Wind dir	Wind speed knots
DAY 01	01						69					
	04						61					
	07	0	UNL	70			74	55	42	32	02	4
	10	0	UNL	70			92	60	37	14	07	5
	13	0	UNL	70			101	62	32	09	09	6
	16	0	UNL	70			103	62	33	09	24	7
	19	0					93					
	22						82					
DAY 02	01						68					
	04						65					
	07	0	UNL	70			74	54	39	28	33	5
	10	0	UNL	70			92	58	30	11	29	4
	13	0	UNL	70			101	61	31	08	05	6
	16	0	UNL	70			104	62	31	08	23	7
	19	0					93					
	22						83					
DAY 03	01						69					
	04						61					
	07	0	UNL	70			74	53	35	24	29	5
	10	0	UNL	70			92	59	34	13	17	7
	13	0	UNL	70			103	61	27	07	17	14
	16	0	UNL	70			103	61	26	06	16	16
	19	0	UNL	70			93	56	21	07	14	12
	22						86					
DAY 04	01						73					
	04						60					
	07	0	UNL	70			73	53	36	26	34	4
	10	0	UNL	70			91	57	29	11	32	3
	13	0	UNL	70			97	59	26	08	23	7
	16	0	UNL	70			99	59	25	07	29	18
	19	0	UNL	70			92	58	31	11	33	3
	22						79					
DAY 05	01						67					
	04						60					
	07	0	UNL	70			70	52	37	30	34	4
	10	0	UNL	70			86	58	38	18	04	4
	13	1	UNL	70			96	59	29	09	17	4
	16	4	UNL	70			97	61	34	11	17	14
	19	3	UNL	70			89	59	38	17	13	11
	22						85					
DAY 06	01						76					
	04						77					
	07	9	150	70			78	57	42	28	23	8
	10	9	150	70			89	60	41	19	16	14
	13	8	150	70			91	62	44	20	16	14
	16	7	110	70			90	62	45	21	16	14
	19	7					86					
	22						83					
DAY 07	01						76					
	04						72					
	07	4	UNL	70			75	62	54	48	36	4
	10	3	UNL	70			87	62	47	25	16	13
	13	6	150	50			91	63	46	21	11	20
	16	8	110	50			86	60	43	22	29	14
	19						80					
	22						75					
DAY 08	01						70					
	04						61					
	07	7	100	70			69	57	51	53	31	7
	10	4	UNL	70			85	62	48	28	31	4
	13	6	120	70			92	62	44	19	14	12
	16	10	95	70			85	60	45	25	07	4
	19						83					
	22						75					
DAY 09	01						66					
	04						60					
	07	0	UNL	70			69	56	47	46	31	8
	10	0	UNL	70			84	60	45	26	00	0
	13	1	UNL	70			94	62	43	17	16	13
	16	2	UNL	70			96	62	38	13	16	16
	19						86					
	22						82					
DAY 10	01						68					
	04						59					
	07	0	UNL	70			70	52	37	30	03	6
	10	0	UNL	70			88	59	38	17	22	10
	13	0	UNL	70			97	62	39	13	19	13
	16	1	UNL	70			98	63	41	14	15	19
	19	1	UNL	70			88	58	34	15	14	13
	22						82					
DAY 11	01						73					
	04						64					
	07	10	100	70			67	50	35	31	00	0
	10	10	120	70			78	59	46	31	26	8
	13	10	120	50		RW	73	58	51	46	31	15
	16	10	110	50			70	59	52	53	30	4
	19	10	160	70			67	60	57	70	36	4
	22						60					
DAY 12	01						55					
	04						53					
	07	10	200	70			59	54	51	75	36	4
	10	10	200	70			73	60	52	48	18	6
	13	10	200	70			80	61	51	36	16	14
	16	10	200	70			82	62	51	34	17	18
	19						74					
	22						68					
DAY 13	01						62					
	04						55					
	07	2	UNL	50			60	55	52	75	34	3
	10	2	UNL	50			75	58	47	37	17	5
	13	3	UNL	50			82	57	38	21	17	15
	16	4	UNL	70			83	55	31	15	15	17
	19						73					
	22						70					
DAY 14	01						62					
	04						55					
	07	0	UNL	70			61	50	42	50	14	4
	10	1	UNL	70			78	54	33	19	19	9
	13	1	UNL	70			83	53	25	12	17	16
	16	1	UNL	70			84	54	26	12	14	15
	19						75					
	22						71					
DAY 15	01						59					
	04						50					
	07	0	UNL	70			60	48	36	41	33	5
	10	0	UNL	70			79	54	32	18	16	16
	13	0	UNL	70			84	55	31	15	16	16
	16	8	90	70			79	56	38	23	22	17
	19						69					
	22						61					
DAY 16	01						55					
	04						50					
	07	0	UNL	70			59	50	42	54	34	5
	10	2	UNL	70			78	57	41	27	16	17
	13	5	UNL	50			84	57	35	17	17	14
	16	9	95	50			79	57	40	25	25	20
	19						73					
	22						70					
DAY 17	01						63					
	04						59					
	07	9	200	50			61	52	46	58	33	4
	10	10	200	50			74	57	45	36	06	5
	13	10	90	50		R	72	57	48	43	09	7
	16	10	90	35			72	55	44	37	02	4
	19						63					
	22						59					
DAY 18	01						58					
	04						59					
	07	10	90	70			62	55	51	67	03	3
	10	10	120	50			70	56	48	46	03	4
	13	10	200	50			76	56	40	27	32	4
	16	10	200	50			81	57	39	22	15	14
	19						72					
	22						67					
DAY 19	01						66					
	04						54					
	07	1	UNL	70			59	51	45	60	00	0
	10	1	UNL	50			72	55	44	37	05	5
	13	4	UNL	50			84	57	38	19	18	14
	16	8	90	50			83	56	35	18	16	10
	19						72					
	22						61					
DAY 20	01						51					
	04						48					
	07	7	UNL	70			58	48	39	49	26	3
	10	3	UNL	70			76	54	35	23	16	11
	13	3	UNL	70			84	54	23	11	18	22
	16	3	UNL	70			85	55	29	13	18	15
	19						75					
	22						70					
DAY 21	01						63					
	04						52					
	07	0	UNL	70			59	46	34	39	03	5
	10	0	UNL	70			76	52	32	20	18	7
	13	0	UNL	70			84	54	28	13	16	13
	16	0	UNL	70			86	56	31	14	18	15
	19						75					
	22						73					
DAY 22	01						58					
	04						48					
	07	0	UNL	70			58	45	30	35	01	4
	10	0	UNL	70			78	53	31	18	10	4
	13	0	UNL	70			87	55	25	10	16	8
	16	0	UNL	70			89	55	22	08	17	13
	19						80					
	22						69					
DAY 23	01						60					
	04						50					
	07	0	UNL	70			60	46	33	36	01	6
	10	2	UNL	70			81	54	30	16	04	5
	13	0	UNL	70			88	54	18	07	16	5
	16	1	UNL	70			92	55	16	06	08	5
	19						81					
	22						69					
DAY 24	01						62					
	04						54					
	07	9	200	70			59	46	33	38	30	4
	10	10	160	70			77	51	25	14	30	6
	13	6	200	70			89	55	22	08	18	8
	16	9	200	70			92	56	18	07	18	8
	19						78					
	22						65					
DAY 25	01						59					
	04						54					
	07	3	UNL	70			64	48	33	32	30	7
	10	7	170	70			83	54	25	12	27	5
	13	9	200	70			90	56	24	09	31	5
	16	8	200	70			93	57	26	09	30	9
	19						80					
	22						70					
DAY 26	01						60					
	04						57					
	07	0	UNL	70			66	50	36	33	29	6
	10	0	UNL	70			85	56	33	15	27	7
	13	0	UNL	70			93	56	21	07	34	6
	16	0	UNL	70			95	57	23	07	34	7
	19						76					
	22						70					
DAY 27	01						63					
	04						53					
	07	0	UNL	70			64	48	33	32	31	6
	10	0	UNL	70			83	55	30	15	32	7
	13	0	UNL	70			94	58	28	09	15	14
	16	0	UNL	70			96	58	27	06	17	14
	19						81					
	22						73					
DAY 28	01						62					
	04						56					
	07	3	UNL	70			65	50	36	34	33	4
	10	6	UNL	70			81	55	34	18	25	5
	13	7	200	70			93	58	30	11	17	20
	16	8	200	70			93	59	33	12	16	22
	19						75					
	22						64					
DAY 29	01						55					
	04						52					
	07	3	UNL	70			59	48	39	48	00	0
	10	1	UNL	70			78	55	37	23	15	18
	13	2	UNL	70			84	58	40	21	14	24
	16	6	200	70			85	59	40	20	16	26
	19						76					
	22						67					
DAY 30	01						57					
	04						48					
	07	0	UNL	70			56	46	36	47	03	6
	10	1	UNL	70			72	51	32	23	13	3
	13	0	UNL	70			81	55	34	18	24	6
	16	0	UNL	70			84	54	27	12	17	5
	19						72					
	22						67					
DAY 31	01						61					
	04						51					
	07	0	UNL	70			60	48	38	44	31	7
	10	0	UNL	70			75	53	36	24	34	4
	13	0	UNL	70			86	58	36	17	12	13
	16	0	UNL	70			88	57	33	14	18	13
	19						77					
	22						73					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH: I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS: MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION
BISHOP CALIFORNIA

YEAR & MONTH
79 08

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

OBSERVATIONS AT 3-HOUR INTERVALS SEPTEMBER 1979

Columns: HOUR | SKY COVER TENTHS | CEILING HNDS. OF FT. | VISIBILITY WHOLE MILES | VISIBILITY 16THS MILE | WEATHER | TEMPERATURE AIR °F | WET BULB °F | DEW PT. °F | REL. HUM. % | WIND DIR | WIND SPEED KNOTS

DAY 01

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						58					
04						50					
07	0	UNL	70			59	46	33	38	06	4
10	0	UNL	70			79	55	36	21	21	9
13	0	UNL	70			88	58	29	12	18	20
16	1	UNL	70			89	57	28	11	15	20
19						77					
22						67					

DAY 02

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						60					
04						52					
07	0	UNL	70			59	46	34	39	32	5
10	0	UNL	70			81	55	32	17	08	4
13	0	UNL	70			87	56	29	12	20	4
16	0	UNL	70			92	57	28	10	24	9
19						80					
22						72					

DAY 03

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						57					
04						53					
07	0	UNL	70			60	48	37	43	02	4
10	0	UNL	70			81	56	38	21	20	3
13	0	UNL	70			88	57	31	13	09	5
16	0	UNL	70			91	57	26	09	16	10
19						77					
22						67					

DAY 04

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						58					
04						52					
07	0	UNL	70			61	47	33	35	34	4
10	0	UNL	70			81	55	34	18	00	0
13	0	UNL	70			90	58	32	13	12	4
16	0	UNL	70			93	59	30	11	21	11
19						82					
22						73					

DAY 05

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						58					
04						57					
07	0	UNL	70			64	54	46	52	31	5
10	0	UNL	70			82	56	35	19	19	5
13	0	UNL	70			94	58	28	09	17	11
16	0	UNL	70			95	58	25	08	16	14
19						84					
22						74					

DAY 06

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						59					
04						55					
07	0	UNL	70			61	46	30	31	34	4
10	0	UNL	70			84	55	30	14	24	4
13	0	UNL	70			94	57	24	08	18	15
16	0	UNL	70			96	58	24	07	17	14
19						83					
22						80					

DAY 07

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						58					
04						54					
07	0	UNL	70			60	45	30	32	02	4
10	0	UNL	70			84	55	30	14	30	4
13	0	UNL	70			95	58	26	08	14	8
16	0	UNL	70			95	59	30	10	14	16
19						82					
22						74					

DAY 08

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						76					
04						61					
07	0	UNL	70			67	52	40	37	05	4
10	0	UNL	70			86	59	42	21	00	0
13	0	UNL	70			98	57	17	05	22	11
16	0	UNL	70			96	57	18	06	23	10
19						82					
22						70					

DAY 09

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						61					
04						55					
07	0	UNL	70			65	47	27	24	31	5
10	0	UNL	70			86	55	28	12	16	5
13	2	UNL	70			95	61	36	13	16	17
16	5	UNL	50			95	61	37	13	15	14
19						82					
22						72					

DAY 10

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						63					
04						60					
07	0	UNL	70			67	49	32	27	30	8
10	0	UNL	70			86	56	31	14	27	5
13	0	UNL	70			95	59	29	09	15	10
16	0	UNL	70			96	58	28	09	18	8
19						81					
22						74					

DAY 11

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						66					
04						63					
07	0	UNL	70			65	50	37	36	33	7
10	0	UNL	70			84	56	34	17	24	3
13	0	UNL	70			95	60	35	12	18	11
16	0	UNL	70			96	60	31	10	23	8
19						81					
22						74					

DAY 12

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						71					
04						62					
07	0	UNL	70			63	48	35	35	30	3
10	0	UNL	70			84	54	27	12	29	9
13	1	UNL	70			94	58	30	10	31	8
16	1	UNL	70			95	59	29	09	26	6
19						80					
22						74					

DAY 13

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						70					
04						61					
07	0	UNL	70			66	49	34	31	33	5
10	0	UNL	70			86	57	35	16	25	5
13	2	UNL	70			94	59	30	10	28	7
16	4	UNL	70			97	60	29	09	29	7
19						86					
22						77					

DAY 14

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						68					
04						60					
07	0	UNL	70			63	49	37	38	35	5
10	0	UNL	70			85	56	32	15	33	6
13	1	UNL	70			93	58	30	11	24	4
16	1	UNL	70			95	58	26	08	34	10
19						82					
22						69					

DAY 15

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						60					
04						55					
07	0	UNL	70			61	46	29	30	36	6
10	0	UNL	70			83	54	27	13	17	3
13	0	UNL	70			92	56	21	07	16	9
16	0	UNL	70			94	57	21	07	19	8
19						81					
22						77					

DAY 16

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						58					
04						50					
07	0	UNL	70			58	42	23	26	01	5
10	0	UNL	70			79	51	19	10	23	4
13	0	UNL	70			89	54	18	07	15	4
16	0	UNL	70			92	55	16	06	29	6
19						81					
22						76					

DAY 17

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						53					
04						51					
07	0	UNL	70			57	43	27	32	36	4
10	0	UNL	70			81	53	28	14	25	4
13	0	UNL	70			91	57	29	11	17	14
16	0	UNL	70			91	57	26	09	18	12
19						80					
22						69					

DAY 18

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						56					
04						57					
07	0	UNL	70			59	45	31	35	34	6
10	0	UNL	70			80	53	28	15	01	6
13	4	UNL	70			91	56	21	08	16	15
16	0	UNL	70			91	57	27	10	11	4
19						77					
22						64					

DAY 19

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						54					
04						47					
07	0	UNL	70			56	43	28	34	32	5
10	0	UNL	70			77	50	21	12	33	5
13	0	UNL	70			87	55	24	10	16	12
16	0	UNL	70			89	53	06	04	00	0
19						75					
22						70					

DAY 20

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						62					
04						51					
07	0	UNL	70			56	42	25	30	33	4
10	0	UNL	70			76	50	22	13	29	4
13	0	UNL	70			82	52	19	09	02	4
16	0	UNL	70			85	53	19	08	24	5
19						73					
22						57					

DAY 21

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						49					
04						45					
07	0	UNL	70			52	38	18	26	33	4
10	0	UNL	70			75	49	21	13	12	4
13	0	UNL	70			89	55	22	09	16	18
16	0	UNL	70			89	55	21	08	16	15
19						75					
22						69					

DAY 22

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						56					
04						48					
07	0	UNL	50			53	41	28	38	32	4
10	0	UNL	50			78	53	32	19	00	0
13	0	UNL	50			88	56	28	11	16	17
16	0	UNL	50			88	57	30	12	16	19
19						77					
22						74					

DAY 23

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						70					
04						52					
07	0	UNL	50			51	45	39	64	32	6
10	0	UNL	50			76	53	33	21	17	3
13	0	UNL	50			85	54	25	11	14	7
16	0	UNL	50			86	54	23	10	25	8
19						75					
22						64					

DAY 24

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						53					
04						48					
07	0	UNL	70			52	42	31	45	31	5
10	3	UNL	70			78	53	31	18	05	4
13	4	UNL	70			86	57	33	15	16	20
16	10	100	35		RW	76	55	41	29	16	20
19	10	47	6		RW	80	57	55	84	17	9
22						57					

DAY 25

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						57					
04						54					
07	3	UNL	70			55	55	55	100	33	3
10	1	UNL	70			70	60	55	59	17	5
13	0	UNL	70			80	57	41	25	15	22
16	0	UNL	70			83	52	19	09	17	13
19	0	UNL	20			69	47	23	18	18	8
22						53					

DAY 26

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						47					
04						43					
07	0	UNL	70			50	41	30	46	36	5
10	0	UNL	70			71	48	27	19	33	7
13	5	UNL	70			79	52	25	14	19	7
16	10	200	70			77	52	26	15	17	4
19	2	UNL	20			63	48	37	38	33	6
22						52					

DAY 27

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						48					
04						45					
07	4	UNL	70			50	42	33	52	34	4
10	7	UNL	70			70	51	34	27	24	4
13	8	200	70			81	53	25	13	17	16
16	10	200	70			78	54	33	19	17	16
19	10	200	20			71	52	34	26	15	10
22						57					

DAY 28

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						50					
04						46					
07	0	UNL	70			49	42	36	61	27	4
10	0	UNL	70			71	51	34	26	00	0
13	0	UNL	70			83	54	28	13	20	4
16	1	UNL	70			83	55	31	15	16	17
19	1	UNL	30			73	53	36	26	15	8
22						60					

DAY 29

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						56					
04						55					
07	7	200	70			58	49	44	60	00	0
10	6	200	50			69	56	49	49	22	6
13	5	UNL	50			79	57	41	26	34	4
16	8	UNL	70			78	56	40	26	34	5
19	9	200	15			67	54	45	45	07	6
22						63					

DAY 30

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	WIND DIR	SPEED KNOTS
01						59					
04						53					
07	5	UNL	45			53	48	44	72	34	4
10	3	UNL	45			75	56	42	31	24	7
13	9	200	70			83	56	35	18	13	18
16	8	150	50			81	54	32	17	11	14
19	10	90	15			73	54	39	29	10	14
22						65					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- TORNADO
T THUNDERSTORM
Q SQUALL
R RAIN
RW RAIN SHOWERS
ZR FREEZING RAIN
L DRIZZLE
ZL FREEZING DRIZZLE
S SNOW
SP SNOW PELLETS
IC ICE CRYSTALS
SW SNOW SHOWERS
SG SNOW GRAINS
IP ICE PELLETS
A HAIL
F FOG
IF ICE FOG
GF GROUND FOG
BD BLOWING DUST
BN BLOWING SAND
BS BLOWING SNOW
BY BLOWING SPRAY
K SMOKE
H HAZE
D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH: I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION
BISHOP CALIFORNIA

YEAR & MONTH
79 09

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

U.S.MAIL
FIRST CLASS

OBSERVATIONS AT 3-HOUR INTERVALS OCTOBER 1979

Day	Hour	Sky Cover Tenths	Ceiling Hnds. of Ft.	Visibility Whole Miles	Visibility 16ths Mile	Weather	Temperature Air °F	Temperature Wet Bulb °F	Temperature Dew Pt. °F	Rel. Hum. %	Wind Dir	Wind Speed Knots
DAY 01	01						57					
	04						52					
	07	7	80	45		T	55	52	49	80	31	6
	10	9	85	70			70	54	41	35	34	4
	13	4	UNL	50			79	57	42	27	28	3
	16	7	100	70			79	57	42	27	15	7
	19	1	UNL	15			70	54	42	36	18	3
	22						57					
DAY 02	01						50					
	04						42					
	07	0	UNL	70			50	45	40	69	33	4
	10	0	UNL	70			74	54	40	29	20	4
	13	1	UNL	70			83	57	38	20	14	8
	16	0	UNL	70			82	57	38	21	18	11
	19	0	UNL	20			70	53	38	32	18	10
	22						56					
DAY 03	01						51					
	04						49					
	07	7	200	70			53	45	38	57	36	4
	10	6	200	70			73	54	40	30	29	4
	13	5	UNL	70			86	58	38	18	17	10
	16	8	200	70			83	56	36	19	17	12
	19	8	200	20			76	54	36	23	14	12
	22						68					
DAY 04	01						60					
	04						57					
	07	0	UNL	70			55	46	39	55	34	6
	10	0	UNL	70			76	54	36	23	18	3
	13	2	UNL	70			86	56	31	14	16	15
	16	6	UNL	70			85	56	31	14	17	16
	19	5	UNL	20			77	53	31	19	15	14
	22						60					
DAY 05	01						57					
	04						54					
	07	9	200	70			57	46	36	46	36	4
	10	0	UNL	70			77	53	33	20	02	4
	13	2	UNL	70			88	57	31	13	19	13
	16	8	200	70			87	55	25	10	17	15
	19	6	UNL	20			72	50	29	20	16	9
	22						57					
DAY 06	01						53					
	04						48					
	07	9	200	70			52	42	32	47	31	5
	10	7	UNL	70			76	52	31	19	15	3
	13	5	UNL	70			87	56	29	12	17	20
	16	5	UNL	70			87	56	27	11	16	18
	19	0	UNL	20			78	52	27	15	16	14
	22						64					
DAY 07	01						52					
	04						49					
	07	8	130	70			56	45	34	44	01	5
	10	3	UNL	70			76	52	30	18	22	3
	13	2	UNL	70			84	54	27	12	18	16
	16	0	UNL	70			83	55	32	16	18	15
	19	0	UNL	20			70	51	34	27	02	6
	22						62					
DAY 08	01						49					
	04						44					
	07	0	UNL	70			50	43	36	59	31	4
	10	1	UNL	70			70	53	38	32	34	4
	13	1	UNL	70			78	52	27	15	11	13
	16	0	UNL	70			76	50	22	13	16	16
	19	0	UNL	20			67	47	26	21	16	16
	22						62					
DAY 09	01						59					
	04						44					
	07	1	UNL	70			44	36	25	47	35	5
	10	1	UNL	70			68	48	28	22	03	4
	13	3	UNL	70			79	52	26	14	17	16
	16	8	200	70			78	51	21	12	14	8
	19	10	200	20			69	47	22	17	17	8
	22						60					
DAY 10	01						47					
	04						44					
	07	2	UNL	70			48	37	24	39	34	5
	10	0	UNL	70			72	48	21	14	02	5
	13	2	UNL	70			84	55	29	14	17	10
	16	7	200	70			84	54	28	13	15	16
	19	6	UNL	20			68	48	27	21	18	6
	22						54					
DAY 11	01						52					
	04						51					
	07	8	200	70			51	41	29	43	34	6
	10	7	200	70			72	51	30	21	32	4
	13	8	200	70			81	54	28	14	13	9
	16	2	UNL	70			82	53	25	12	15	13
	19	0	UNL	15			71	48	24	17	16	13
	22						52					
DAY 12	01						46					
	04						45					
	07	9	150	70			48	40	30	50	30	7
	10	8	200	70			70	50	32	25	00	0
	13	10	UNL	70			79	53	29	16	17	7
	16	8	150	70			81	53	26	13	17	15
	19	7	200	15			71	50	30	22	14	8
	22						64					
DAY 13	01						51					
	04						46					
	07	9	250	70			45	39	32	60	36	7
	10	8	UNL	50			67	48	32	27	33	4
	13	10	160	70			76	52	28	17	16	18
	16	10	150	7			73	50	26	17	17	11
	19	10	200	15			67	48	29	24	14	9
	22						63					
DAY 14	01						48					
	04						42					
	07	0	UNL	50			44	38	32	63	32	4
	10	1	UNL	70			65	49	34	32	29	4
	13	6	UNL	70			76	53	33	21	17	9
	16	0	UNL	70			75	52	32	21	17	11
	19						64					
	22						58					
DAY 15	01						47					
	04						43					
	07	2	UNL	70			46	41	35	66	34	4
	10	3	UNL	70			66	50	36	33	15	3
	13	5	UNL	70			78	55	37	23	34	4
	16	6	200	70			78	55	36	22	17	18
	19						67					
	22						60					
DAY 16	01						50					
	04						48					
	07	7	UNL	70			51	44	38	61	32	6
	10	3	UNL	70			68	52	40	36	25	5
	13	6	UNL	70			77	56	39	26	23	8
	16	7	UNL	70			77	55	38	25	18	8
	19						64					
	22						60					
DAY 17	01						53					
	04						46					
	07	2	UNL	70			45	40	36	71	30	7
	10	8	UNL	70			69	52	37	31	30	4
	13	1	UNL	70			76	54	36	23	05	3
	16	5	UNL	70			78	54	34	20	16	11
	19						63					
	22						56					
DAY 18	01						49					
	04						43					
	07	9	150	50			47	40	33	58	34	6
	10	10	250	7			64	48	34	33	09	3
	13	10	250	50			71	51	34	26	18	7
	16	10	130	50			69	52	37	31	04	6
	19						62					
	22						61					
DAY 19	01						55					
	04						48					
	07	4	UNL	70			51	44	36	57	32	8
	10	5	UNL	70			73	53	37	27	03	7
	13	7	150	70			78	54	33	19	28	12
	16	8	150	50			77	53	33	20	25	30
	19						65					
	22						56					
DAY 20	01						51					
	04						44					
	07	1	UNL	50			45	43	41	86	20	7
	10	0	UNL	70			61	44	24	24	36	14
	13	0	UNL	70			64	42	11	12	01	16
	16	0	UNL	70			61	41	13	15	36	14
	19						50					
	22						44					
DAY 21	01						45					
	04						40					
	07	10	UNL	70			41	32	18	40	35	16
	10	3	UNL	70			53	37	10	18	35	11
	13	4	UNL	70			59	40	08	13	31	5
	16	0	UNL	70			63	41	03	09	29	4
	19	0	UNL	20			48	36	16	28	19	6
	22						37					
DAY 22	01						33					
	04						30					
	07	7	200	70			29	25	17	61	30	4
	10	10	200	70			52	38	18	26	00	0
	13	10	200	70			63	44	20	19	16	14
	16	8	200	70			64	44	19	18	15	10
	19	9	200	20			50	39	25	38	03	4
	22						40					
DAY 23	01						36					
	04						34					
	07	1	UNL	70			35	29	19	52	02	5
	10	7	UNL	70			58	42	20	23	00	0
	13	7	UNL	70			68	46	20	16	12	5
	16	9	200	70			70	47	17	13	16	11
	19	8	200	20			50	39	26	39	33	6
	22						47					
DAY 24	01						40					
	04						36					
	07	1	UNL	70			33	30	25	72	30	4
	10	0	UNL	70			63	44	22	21	23	4
	13	0	UNL	70			72	48	20	14	15	13
	16	0	UNL	70			73	48	20	13	16	14
	19	0	UNL	20			65	45	21	19	17	22
	22						57					
DAY 25	01						45					
	04						37					
	07	0	UNL	70			34	29	22	62	27	5
	10	0	UNL	70			62	44	23	22	20	10
	13	2	UNL	50			78	50	17	10	21	17
	16	10	90	45			68	51	38	33	15	6
	19	2	UNL	20			54	46	38	55	30	9
	22						47					
DAY 26	01						47					
	04						40					
	07	0	UNL	70			40	34	24	53	30	9
	10	0	UNL	70			63	44	20	19	01	16
	13	0	UNL	70			72	46	09	09	35	9
	16	0	UNL	70			73	46	09	08	23	5
	19	0	UNL	20			59	41	15	18	03	4
	22						47					
DAY 27	01						38					
	04						34					
	07	0	UNL	70			32	28	20	61	34	8
	10	0	UNL	70			60	42	17	19	25	4
	13	0	UNL	70			73	48	19	13	36	3
	16	0	UNL	70			72	47	13	10	16	13
	19	0	UNL	20			48	36	19	32	32	8
	22						40					
DAY 28	01						37					
	04						34					
	07	0	UNL	70			31	27	18	59	28	6
	10	0	UNL	70			65	43	12	12	01	14
	13	0	UNL	70			72	44	-04	05	28	9
	16	0	UNL	70			64	42	09	11	34	18
	19						48					
	22						43					
DAY 29	01						41					
	04						37					
	07	0	UNL	70			39	30	15	38	01	21
	10	0	UNL	50			46	35	19	34	01	20
	13	0	UNL	70			54	39	18	24	01	22
	16	0	UNL	70			53	38	15	22	01	20
	19						45					
	22						40					
DAY 30	01						40					
	04						33					
	07	0	UNL	70			30	26	19	64	36	7
	10	2	UNL	70			51	36	08	17	19	3
	13	4	UNL	70			61	40	06	11	17	11
	16	7	90	70			60	40	08	12	16	10
	19						44					
	22						33					
DAY 31	01						26					
	04						22					
	07	0	UNL	70			23	19	08	55	30	5
	10	0	UNL	70			56	41	24	28	36	19
	13	0	UNL	70			62	44	21	21	01	12
	16	0	UNL	70			62	44	21	21	02	9
	19						51					
	22						42					

NOTES

CEILING

UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS. INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS: MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION

BISHOP CALIFORNIA

YEAR & MONTH

79 10

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

OBSERVATIONS AT 3-HOUR INTERVALS MAY 1980

Columns: HOUR | SKY COVER TENTHS | CEILING HNDS. OF FT. | VISIBILITY WHOLE MILES | VISIBILITY 16THS MILE | WEATHER | TEMPERATURE AIR °F | WET BULB °F | DEW PT. °F | REL. HUM. % | WIND DIR | WIND SPEED KNOTS

DAY 01

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						45					
07	9	90	45			51	39	25	36	03	8
10	10	90	45			61	44	25	25	17	9
13	5	UNL	50			64	49	36	35	16	13
16	4	UNL	50			67	52	39	36	15	18
19	0	UNL	70			58	49	41	53	16	14
22						52					

DAY 02

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						50					
04						44					
07	0	UNL	70			51	45	39	64	30	4
10	0	UNL	70			66	51	39	37	19	6
13	3	UNL	70			77	54	35	22	16	5
16	3	UNL	70			78	54	32	19	16	13
19	5	UNL	70			69	53	41	36	15	12
22						60					

DAY 03

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						48					
07	10	UNL	45			57	50	44	62	34	4
10	10	200	45			71	55	43	37	26	6
13	10	70	45		TRW	72	55	42	34	06	17
16	10	70	45			74	55	41	31	33	15
19	10	60	40			69	53	41	36	06	7
22						58					

DAY 04

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						51					
04						46					
07	0	UNL	70			56	47	40	55	34	4
10	1	UNL	70			72	55	43	35	00	0
13	3	UNL	70			79	55	37	22	15	9
16	4	UNL	70			80	54	32	17	20	8
19	5	UNL	70			70	54	41	35	35	11
22						61					

DAY 05

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						45					
07	7	UNL	70			57	49	42	57	32	4
10	9	UNL	70			73	55	41	32	08	4
13	10	UNL	70			80	54	32	17	18	8
16	10	140	70			79	54	33	19	25	16
19	9	120	70			72	51	33	24	25	5
22						61					

DAY 06

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						50					
04						44					
07	0	UNL	70			57	46	36	46	31	7
10	0	UNL	70			72	51	32	23	10	3
13	2	UNL	70			77	52	29	17	00	0
16	4	UNL	70			80	52	24	13	25	16
19	2	UNL	70			70	48	25	18	35	13
22						61					

DAY 07

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						54					
04						50					
07	0	UNL	70			56	45	34	44	36	14
10	4	UNL	70			65	47	29	26	01	20
13	6	70	70			70	48	25	18	35	14
16	4	UNL	70			72	51	31	22	36	16
19	1	UNL	70			65	48	32	29	36	14
22						55					

DAY 08

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						49					
04						42					
07	1	UNL	70			53	45	36	53	30	4
10	0	UNL	70			68	50	33	27	24	3
13	8	160	70			77	53	31	19	15	7
16	9	160	70			74	49	23	15	25	20
19						64					
22						54					

DAY 09

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						55					
04						50					
07	10	150	70			57	44	29	34	01	12
10	8	90	70			65	47	27	24	35	10
13	7	150	70			67	47	26	21	02	18
16	6	200	70			64	45	23	21	23	15
19	3	UNL	70			56	41	23	28	27	10
22						48					

DAY 10

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						41					
04						39					
07	10	80	50			49	37	21	33	36	11
10	3	UNL	70			55	37	05	13	26	15
13	3	UNL	70			57	38	04	12	24	3
16	9	90	70			54	37	04	13	02	14
19	6	90	70			49	36	16	27	34	15
22						42					

DAY 11

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						35					
04						35					
07	10	20	5		SWF	36	36	35	96	02	8
10	10	50	70			44	39	33	65	32	6
13	9	200	70			59	45	31	35	04	4
16	10	90	70			61	45	29	30	32	8
19	10	200	70			55	41	21	27	01	16
22						48					

DAY 12

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						41					
04						42					
07	6	90	70			51	42	32	48	01	4
10	7	80	70			62	46	29	29	27	10
13	9	120	70			65	46	25	22	22	3
16	9	120	70			66	47	28	24	34	7
19	7	120	70			60	46	32	35	32	5
22						55					

DAY 13

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						47					
07	10	150	50			52	44	36	55	32	6
10	10	150	50			59	46	34	39	13	18
13	10	60	50			64	48	33	32	21	12
16	7	60	50			64	49	35	34	18	10
19	10	70	30			58	46	35	42	07	3
22						50					

DAY 14

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						47					
04						45					
07	10	50	30		RW	46	45	43	89	36	12
10	8	50	40			54	47	41	62	34	9
13	4	UNL	50			63	50	39	41	34	10
16	6	200	50			66	50	36	33	34	3
19	10	50	70			56	47	38	51	31	22
22						48					

DAY 15

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						44					
04						45					
07	2	UNL	50			55	46	38	53	03	6
10	1	UNL	50			65	49	35	33	04	6
13	1	UNL	50			70	50	31	24	27	7
16	1	UNL	70			75	52	30	19	01	5
19	0	UNL	70			68	51	36	31	34	5
22						58					

DAY 16

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						49					
04						43					
07	0	UNL	70			55	46	38	53	01	5
10	0	UNL	70			70	52	37	30	00	0
13	0	UNL	70			79	53	29	16	00	0
16	10	220	70			82	55	30	15	29	4
19	9	200	70			69	51	37	31	34	17
22						61					

DAY 17

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						56					
04						52					
07	2	UNL	50			59	44	26	28	36	9
10	0	UNL	70			71	49	27	19	31	7
13	0	UNL	70			77	53	30	18	20	5
16	0	UNL	70			81	54	30	16	22	5
19	0					71					
22						64					

DAY 18

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						52					
04						47					
07	0	UNL	70			59	46	33	38	33	7
10	0	UNL	70			71	48	24	17	34	4
13	0	UNL	70			80	54	32	17	27	8
16	8	UNL	70			81	54	28	14	18	10
19	0	UNL	70			73	53	36	26	15	6
22						63					

DAY 19

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						52					
04						48					
07	9	UNL	70			61	49	39	44	33	4
10	4	UNL	70			78	55	36	22	15	4
13	3	UNL	70			84	55	30	14	17	16
16	0	UNL	70			85	55	30	14	19	13
19	0					74					
22						62					

DAY 20

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						52					
04						48					
07	0	UNL	70			61	49	39	44	34	4
10	0	UNL	70			80	54	32	17	21	7
13	1	UNL	70			86	55	28	12	18	13
16	7	200	70			86	55	28	12	19	14
19	7					73					
22						58					

DAY 21

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						54					
04						49					
07	5	UNL	50			63	48	33	33	01	5
10	8	140	50			82	55	31	16	20	7
13	8	250	70			82	54	29	14	17	17
16	4	UNL	70			83	51	09	06	15	16
19	4					68					
22						54					

DAY 22

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						46					
04						43					
07	0	UNL	70			58	45	32	37	00	0
10	0	UNL	70			73	52	34	24	18	10
13	7	70	50			81	53	28	14	17	15
16	5	UNL	50			82	54	29	14	25	11
19	4					65					
22						54					

DAY 23

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						48					
07	0	UNL	70			57	40	14	18	20	6
10	2	UNL	70			59	39	05	11	27	18
13	2	UNL	70			55	39	14	20	25	30
16	8	70	50			51	37	13	22	31	14
19	7	70	50			47	34	10	22	36	14
22						40					

DAY 24

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						39					
04						27					
07	10	90	70			45	33	14	29	01	17
10	5	UNL	70			53	38	14	21	04	6
13	9	70	70			51	38	20	29	34	19
16	10	70	70			51	38	21	31	01	10
19	10	60	40			42	36	28	58	27	10
22						41					

DAY 25

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						30					
04						37					
07	2	UNL	70			40	34	24	53	03	5
10	0	UNL	70			54	39	19	25	15	4
13	2	UNL	70			61	40	08	12	07	7
16	8	80	50			63	43	14	15	18	10
19	9	200	50			55	42	27	34	36	18
22						49					

DAY 26

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						46					
04						37					
07	6	200	70			46	38	29	52	35	4
10	3	UNL	45			61	43	20	20	18	13
13	6	80	45			69	44	06	08	18	15
16	6	80	45			64	44	18	17	18	14
19	4	UNL	50			59	43	24	26	15	10
22						53					

DAY 27

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						40					
04						35					
07	1	UNL	70			50	39	27	41	35	4
10	9	UNL	70			62	45	26	25	02	5
13	7	90	50			70	48	24	18	15	14
16	8	90	50			70	47	20	15	13	10
19	6	90	50			64	45	23	21	16	12
22						56					

DAY 28

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						45					
04						40					
07	10	60	45		RW	50	45	40	69	12	8
10	8	90	45			57	47	37	47	02	4
13	4	UNL	50			66	49	34	31	15	9
16	4	UNL	50			68	50	34	29	29	4
19	9	70	50			61	48	37	41	32	3
22						52					

DAY 29

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						46					
04						40					
07	0	UNL	50			53	46	39	59	00	0
10	1	UNL	50			67	50	35	31	13	5
13	5	UNL	50			72	51	32	23	17	15
16	4	UNL	70			73	49	25	17	16	8
19	8	80	70			67	49	33	28	33	16
22						57					

DAY 30

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						50					
04						48					
07	6	UNL	50			58	48	40	51	32	9
10	7	UNL	40			66	50	36	33	28	7
13	10	70	70			68	49	31	25	24	6
16	10	70	70			68	49	31	25	36	11
19	6	200	70			62	47	34	35	36	10
22						59					

DAY 31

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	WHOLE MILES	16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						43					
04						43					
07	2	UNL	50			53	45	38	57	30	6
10	5	UNL	50			66	49	33	29	07	6
13	8	200	50			70	51	34	27	16	13
16	9	70	50		T	63	48	35	35	13	18
19	10	70	30		RW	55	50	47	75	32	8
22						48					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS, INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION	YEAR & MONTH
BISHOP CALIFORNIA	80 05

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

U.S. MAIL
FIRST CLASS

OBSERVATIONS AT 3-HOUR INTERVALS — JUNE 1980

Day	Hour	Sky Cover Tenths	Ceiling Hnds. of Ft.	Visibility Whole Miles	Visibility 16ths Mile	Weather	Air °F	Wet Bulb °F	Dew Pt. °F	Rel. Hum. %	Wind Dir	Wind Speed Knots
01	01						43					
01	04						40					
01	07	3	UNL	70			53	47	42	66	01	6
01	10	6	UNL	50			66	50	36	33	31	8
01	13	4	UNL	70			71	50	30	22	34	6
01	16	8	90	70			74	51	29	19	29	6
01	19	3	UNL	70			69	50	33	26	32	6
01	22						60					
02	01						51					
02	04						44					
02	07	5	UNL	70			58	46	35	42	00	0
02	10	2	UNL	70			70	48	24	18	36	5
02	13	2	UNL	70			80	51	19	10	31	9
02	16	8	160	70			75	49	20	13	27	19
02	19	9	UNL	70			68	48	27	21	01	12
02	22						55					
03	01						48					
03	04						40					
03	07	0	UNL	70			52	40	26	37	31	4
03	10	0	UNL	70			67	48	28	23	15	9
03	13	2	UNL	70			78	51	23	13	24	14
03	16	1	UNL	70			75	50	23	14	26	13
03	19	7	UNL	70			68	47	24	19	29	10
03	22						56					
04	01						47					
04	04						42					
04	07	2	UNL	70			54	43	31	42	32	5
04	10	1	UNL	70			70	49	28	21	17	14
04	13	3	UNL	70			77	51	26	15	18	15
04	16	3	UNL	70			75	48	15	10	29	19
04	19	0	UNL	70			67	43	07	09	28	13
04	22						53					
05	01						44					
05	04						39					
05	07	0	UNL	70			54	40	22	29	01	5
05	10	0	UNL	70			66	45	20	17	14	12
05	13	0	UNL	70			75	48	12	09	19	8
05	16	0	UNL	70			75	47	09	08	26	22
05	19	0	UNL	70			68	45	15	13	26	13
05	22						57					
06	01						50					
06	04						48					
06	07	1	UNL	70			55	41	25	31	28	5
06	10	0	UNL	70			67	47	25	20	35	8
06	13	1	UNL	70			74	48	17	11	22	5
06	16	0	UNL	70			76	49	18	11	15	9
06	19	0	UNL	70			70	49	26	19	19	6
06	22						56					
07	01						46					
07	04						42					
07	07	0	UNL	70			57	44	30	36	01	3
07	10	0	UNL	70			70	49	28	21	00	0
07	13	0	UNL	70			81	52	22	11	17	9
07	16	0	UNL	70			83	53	22	10	17	9
07	19	0	UNL	70			76	51	26	16	15	14
07	22						59					
08	01						52					
08	04						46					
08	07	4	UNL	70			60	46	32	35	35	4
08	10	8	UNL	70			76	53	34	22	13	3
08	13	5	UNL	70			88	55	24	10	19	14
08	16	0	UNL	70			88	54	20	08	18	4
08	19	0	UNL	70			80	52	22	12	26	7
08	22						65					
09	01						53					
09	04						46					
09	07	0	UNL	70			63	47	32	31	31	7
09	10	0	UNL	70			80	52	24	13	18	3
09	13	0	UNL	70			89	54	15	06	13	7
09	16	0	UNL	70			90	54	14	06	34	5
09	19	0					77					
09	22						63					
10	01						55					
10	04						50					
10	07	0	UNL	70			65	48	32	29	30	5
10	10	0	UNL	70			79	51	22	12	02	4
10	13	0	UNL	70			89	54	17	07	14	5
10	16	0	UNL	70			88	53	14	06	24	13
10	19	0					73					
10	22						62					
11	01						65					
11	04						59					
11	07	0	UNL	70			66	47	27	23	23	6
11	10	0	UNL	70			78	49	13	08	16	11
11	13	0	UNL	70			82	51	11	07	25	18
11	16	0	UNL	70			80	49	08	06	23	14
11	19	0					70					
11	22						66					
12	01						60					
12	04						51					
12	07	0	UNL	70			63	45	24	23	36	8
12	10	0	UNL	70			71	46	14	11	16	5
12	13	0	UNL	70			80	49	08	06	24	11
12	16	0	UNL	70			79	49	06	06	26	15
12	19	0					70					
12	22						56					
13	01						47					
13	04						43					
13	07	0	UNL	70			58	42	24	27	34	6
13	10	0	UNL	70			73	48	16	11	15	6
13	13	0	UNL	70			77	48	09	07	04	4
13	16	0	UNL	70			78	48	06	06	29	13
13	19	0	UNL	70			68	46	21	17	27	20
13	22						56					
14	01						49					
14	04						42					
14	07	10	UNL	70			59	43	25	27	25	8
14	10	0	UNL	70			71	48	24	17	24	4
14	13	0	UNL	70			77	51	23	13	28	8
14	16	0	UNL	70			81	52	22	11	13	9
14	19	0	UNL	70			78	51	22	12	33	5
14	22						63					
15	01						55					
15	04						46					
15	07	0	UNL	70			63	47	31	30	31	9
15	10	1	UNL	70			76	51	27	16	23	7
15	13	1	UNL	70			83	54	27	13	17	7
15	16	2	UNL	70			87	54	21	09	27	6
15	19	0	UNL	70			80	54	32	17	16	5
15	22						64					
16	01						60					
16	04						53					
16	07	9	UNL	70			65	50	36	34	32	6
16	10	10	UNL	70			82	54	29	14	15	7
16	13	8	UNL	70			89	55	22	09	17	8
16	16	1	UNL	70			92	56	21	07	20	7
16	19	4	UNL	70			83	54	27	13	17	8
16	22						75					
17	01						59					
17	04						52					
17	07	7	UNL	50			66	49	34	31	33	5
17	10	5	UNL	50			82	55	32	16	00	0
17	13	5	UNL	50			89	56	27	11	16	18
17	16	1	UNL	70			92	57	26	09	15	13
17	19	1	UNL	70			83	54	28	13	15	8
17	22						68					
18	01						59					
18	04						54					
18	07	0	UNL	50			67	51	39	36	00	0
18	10	0	UNL	50			83	55	32	16	33	4
18	13	0	UNL	70			89	55	23	09	29	9
18	16	0	UNL	70			91	56	22	08	24	5
18	19	0	UNL	70			82	57	37	20	33	7
18	22						70					
19	01						62					
19	04						54					
19	07	0	UNL	70			67	52	39	36	30	4
19	10	0	UNL	70			82	56	36	19	00	0
19	13	0	UNL	70			90	57	27	10	17	10
19	16	0	UNL	70			92	57	24	08	15	17
19	19	0	UNL	70			83	54	29	14	16	12
19	22						72					
20	01						64					
20	04						54					
20	07	1	UNL	70			66	51	38	36	00	0
20	10	1	UNL	70			80	55	35	20	06	6
20	13	0	UNL	70			90	56	25	09	19	8
20	16	0	UNL	70			91	57	26	09	18	9
20	19	0	UNL	45			82	54	27	13	14	12
20	22						71					
21	01						62					
21	04						55					
21	07	0	UNL	70			64	49	36	35	30	4
21	10	0	UNL	70			80	55	35	20	01	3
21	13	0	UNL	50			89	55	22	09	17	15
21	16	0	UNL	50			90	56	24	09	15	11
21	19	0	UNL	50			85	55	28	13	00	0
21	22						66					
22	01						55					
22	04						49					
22	07	9	UNL	70			63	47	31	30	32	5
22	10	7	UNL	70			79	52	24	13	09	5
22	13	4	UNL	70			89	55	22	09	15	18
22	16	6	250	70			92	55	16	05	25	7
22	19	7	220	70			81	51	20	10	30	11
22	22						75					
23	01						60					
23	04						60					
23	07	0	UNL	70			67	47	23	19	36	8
23	10	0	UNL	70			79	51	19	10	30	8
23	13	0	UNL	70			83	51	13	07	09	3
23	16	0	UNL	70			87	53	18	08	30	5
23	19	0	UNL	70			81	53	29	15	30	5
23	22						66					
24	01						57					
24	04						48					
24	07	0	UNL	70			62	49	37	40	00	0
24	10	0	UNL	70			76	52	29	18	13	10
24	13	0	UNL	70			84	54	26	12	16	15
24	16	0	UNL	70			87	57	33	14	16	18
24	19	0	UNL	50			81	55	34	18	16	9
24	22						68					
25	01						59					
25	04						50					
25	07	0	UNL	70			62	49	38	41	30	3
25	10	0	UNL	70			77	53	32	19	20	10
25	13	0	UNL	70			88	56	28	11	17	14
25	16	0	UNL	70			89	57	29	11	17	14
25	19	0	UNL	70			84	54	25	11	23	9
25	22						68					
26	01						60					
26	04						49					
26	07	0	UNL	70			66	50	37	34	36	5
26	10	0	UNL	70			82	54	30	15	14	6
26	13	0	UNL	70			90	57	29	11	05	5
26	16	0	UNL	70			92	57	26	09	31	10
26	19	0	UNL	70			83	55	31	15	32	6
26	22						67					
27	01						67					
27	04						54					
27	07	0	UNL	70			66	46	25	21	34	7
27	10	8	UNL	70			78	51	21	12	23	4
27	13	8	250	70			88	55	25	10	18	5
27	16	9	UNL	70			91	56	24	09	15	6
27	19	9	250	70			82	58	42	24	00	0
27	22						70					
28	01						61					
28	04						54					
28	07	7	250	70			70	54	41	35	32	4
28	10	4	UNL	70			87	59	39	18	29	4
28	13	8	200	70			96	58	25	08	14	8
28	16	10	200	50			94	59	31	11	27	14
28	19	9	200	50			88	59	37	16	36	6
28	22						76					
29	01						73					
29	04						64					
29	07	6	200	70			76	59	48	37	09	4
29	10	7	200	70			86	61	45	24	13	4
29	13	10	90	50			92	61	40	16	25	8
29	16	10	150	70			87	60	41	20	27	8
29	19	9	150	70			85	59	42	22	27	4
29	22						78					
30	01						70					
30	04						67					
30	07	10	120	70			71	56	45	39	00	0
30	10	10	110	45			81	60	46	29	29	9
30	13	10	110	45			85	61	46	26	18	8
30	16	10	200	70			85	61	47	27	01	5
30	19	10					76					
30	22						67					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS, INDICATED IN TENS OF DEGREES FROM TRUE NORTH: I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 80 06

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

OBSERVATIONS AT 3-HOUR INTERVALS JULY 1980

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMPERATURE AIR °F	TEMPERATURE WET BULB °F	TEMPERATURE DEW PT. °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
DAY 01											
01						60					
04						55					
07	10	160	45			65	55	49	56	00	0
10	7	75	45			80	60	48	33	16	14
13	10	70	45		RW	77	57	44	31	25	14
16	8	90	45			80	60	48	33	17	17
19	8					75					
22						70					
DAY 02											
01						62					
04						56					
07	0	UNL	70			69	56	48	47	16	15
10	1	UNL	70			79	59	45	30	16	19
13	1	UNL	70			85	58	39	20	16	18
16	1	UNL	70			86	58	37	18	17	16
19	1					79					
22						67					
DAY 03											
01						58					
04						53					
07	0	UNL	70			65	52	43	45	32	4
10	0	UNL	70			77	56	41	28	27	6
13	0	UNL	70			85	59	41	21	00	0
16	1	UNL	70			90	58	32	13	17	4
19	1					80					
22						67					
DAY 04											
01						57					
04						50					
07	0	UNL	70			65	48	32	29	31	4
10	0	UNL	70			81	52	23	12	25	5
13	0	UNL	70			90	54	12	05	16	5
16	0	UNL	70			92	55	16	06	26	25
19	0	UNL	70			82	53	24	12	29	13
22						67					
DAY 05											
01						57					
04						48					
07	0	UNL	70			62	46	29	29	00	0
10	1	UNL	70			80	52	24	13	00	0
13	1	UNL	70			90	54	12	05	15	11
16	8	200	70			92	54	10	05	25	7
19	9	200	70			85	52	13	07	18	8
22						70					
DAY 06											
01						60					
04						52					
07	9	250	70			61	46	29	30	31	4
10	7	UNL	70			78	51	22	12	00	0
13	10	UNL	70			91	55	18	07	15	13
16	10	UNL	70			94	56	16	06	17	13
19	9	UNL	70			85	53	19	09	14	16
22						77					
DAY 07											
01						73					
04						65					
07	8	200	50			66	50	37	34	36	4
10	6	200	50			84	53	22	10	16	11
13	6	200	45			91	56	24	09	13	17
16	6	200	45			88	56	29	12	21	11
19	7	200	45			82	55	30	15	06	6
22						75					
DAY 08											
01						75					
04						66					
07	0	UNL	70			75	53	34	22	15	13
10	0	UNL	70			85	55	27	12	17	18
13	1	UNL	70			91	56	24	09	17	10
16	0	UNL	70			91	55	18	07	20	16
19	0	UNL	70			82	52	18	09	25	6
22						67					
DAY 09											
01						70					
04						63					
07	7	200	70			61	47	32	34	30	5
10	1	UNL	70			82	50	08	06	16	20
13	0	UNL	70			90	53	07	04	14	15
16	0	UNL	70			92	55	17	06	18	13
19	0	UNL	70			83	53	21	10	24	6
22						74					
DAY 10											
01						56					
04						52					
07	0	UNL	70			63	48	33	33	32	5
10	0	UNL	70			82	53	25	12	00	0
13	0	UNL	70			91	56	22	08	18	10
16	0	UNL	70			94	57	24	08	14	8
19	0	UNL	70			85	56	30	14	32	7
22						68					
DAY 11											
01						59					
04						52					
07	1	UNL	70			66	49	33	29	36	4
10	0	UNL	70			84	56	33	16	07	5
13	0	UNL	70			93	57	24	08	19	7
16	0	UNL	70			97	58	22	07	18	9
19	0	UNL	70			87	54	21	09	26	12
22						70					
DAY 12											
01						61					
04						52					
07	0	UNL	70			66	50	36	33	31	4
10	0	UNL	70			83	54	28	13	17	5
13	1	UNL	70			89	57	30	12	16	5
16	0	UNL	70			94	57	25	08	14	8
19	0	UNL	70			84	55	30	14	30	11
22						72					
DAY 13											
01						60					
04						55					
07	0	UNL	70			68	52	38	33	02	3
10	1	UNL	70			80	55	35	20	00	0
13	5	UNL	70			87	57	33	14	20	9
16	4	UNL	50			89	57	30	12	17	11
19	4	UNL	50			80	55	35	20	01	13
22						72					
DAY 14											
01						63					
04						55					
07	0	UNL	70			65	52	41	42	00	0
10	0	UNL	70			82	57	39	22	34	5
13	0	UNL	70			89	58	32	13	13	7
16	0	UNL	70			92	59	34	13	21	7
19	0					82					
22						75					
DAY 15											
01						65					
04						57					
07	0	UNL	70			68	53	41	38	00	0
10	0	UNL	70			82	57	37	20	12	5
13	1	UNL	70			93	58	29	10	18	10
16	3	UNL	70			95	59	29	09	19	7
19	0					93					
22						75					
DAY 16											
01						68					
04						59					
07	0	UNL	70			71	53	39	31	01	4
10	0	UNL	70			87	59	38	18	00	0
13	0	UNL	70			96	60	34	11	20	7
16	1	UNL	70			98	61	34	11	24	7
19						90					
22						78					
DAY 17											
01						70					
04						67					
07	0	UNL	70			76	59	49	39	32	5
10	0	UNL	70			88	61	44	22	29	5
13	1	UNL	70			95	63	44	17	28	5
16	3	UNL	70			100	64	41	13	29	7
19	3					92					
22						80					
DAY 18											
01						75					
04						65					
07	0	UNL	70			73	56	43	34	00	0
10	0	UNL	70			91	60	38	15	00	0
13	1	UNL	70			98	61	35	11	06	7
16	0	UNL	70			99	60	28	08	25	10
19	0	UNL	70			88	56	28	11	31	6
22						75					
DAY 19											
01						65					
04						58					
07	0	UNL	70			69	50	31	24	29	4
10	0	UNL	70			86	56	31	14	28	4
13	0	UNL	70			95	59	31	10	17	6
16	0	UNL	70			99	60	27	08	26	5
19	0	UNL	70			89	61	44	21	00	0
22						73					
DAY 20											
01						64					
04						57					
07	0	UNL	70			70	52	37	30	00	0
10	0	UNL	70			88	57	33	14	00	0
13	0	UNL	70			97	59	28	09	17	12
16	0	UNL	70			99	59	26	07	17	16
19	0	UNL	70			89	56	27	11	15	13
22						83					
DAY 21											
01						63					
04						57					
07	0	UNL	70			69	50	33	26	33	4
10	0	UNL	70			90	57	30	12	00	0
13	0	UNL	70			99	63	40	13	15	13
16	2	UNL	70			100	63	38	12	15	10
19	1	UNL	70			92	61	41	17	16	13
22						79					
DAY 22											
01						68					
04						63					
07	0	UNL	70			73	57	46	38	32	5
10	0	UNL	70			93	62	42	17	00	0
13	1	UNL	70			100	64	40	13	16	12
16	4	UNL	70			102	64	40	12	17	10
19	4					88					
22						82					
DAY 23											
01						69					
04						68					
07	0	UNL	70			74	53	35	24	00	0
10	0	UNL	50			92	62	44	19	13	5
13	1	UNL	50			100	64	42	14	09	6
16	5	UNL	50			99	64	43	15	32	10
19	5					85					
22						78					
DAY 24											
01						74					
04						64					
07	0	UNL	70			74	58	48	40	32	5
10	0	UNL	50			90	64	51	26	29	3
13	2	UNL	50			99	66	48	18	02	6
16	3	UNL	50			102	66	46	15	21	6
19	3					90					
22						83					
DAY 25											
01						69					
04						64					
07	0	UNL	70			77	60	51	40	29	5
10	0	UNL	70			93	62	43	18	31	5
13	2	UNL	70			102	64	40	12	17	8
16	10	150	70			101	65	44	14	19	12
19	10					91					
22						78					
DAY 26											
01						72					
04						66					
07	4	UNL	70			74	58	50	43	30	5
10	1	UNL	50			92	62	46	20	00	0
13	7	100	50			102	64	40	12	15	12
16	10	100	40			88	63	50	27	34	14
19	8	140	50			83	61	47	28	36	5
22						72					
DAY 27											
01						65					
04						63					
07	5	UNL	70			76	60	51	42	35	4
10	1	UNL	70			89	63	49	25	11	3
13	4	UNL	70			100	64	40	13	33	5
16	9	100	50		TRW	89	62	46	23	36	12
19	9	100	50			81	63	53	38	02	7
22						72					
DAY 28											
01						65					
04						65					
07	4	UNL	70			72	63	59	64	28	5
10	2	UNL	70			88	64	51	28	36	5
13	5	UNL	70			97	65	47	18	10	5
16	9	100	50		RW	91	64	49	24	17	15
19	1	UNL	70			80	63	53	39	33	7
22						77					
DAY 29											
01						70					
04						61					
07	0	UNL	45			73	61	55	53	29	4
10	1	UNL	45			89	64	50	26	24	4
13	4	UNL	45			97	64	45	17	25	4
16	7	100	50			97	63	40	14	27	9
19	1	UNL	50			89	61	44	21	32	10
22						79					
DAY 30											
01						72					
04						64					
07	0	UNL	45			73	59	51	46	34	4
10	5	UNL	45			89	62	46	23	32	4
13	8	140	45			98	61	36	11	28	8
16	9	100	45			94	63	44	18	27	14
19	10	140	50			84	61	46	27	35	7
22						78					
DAY 31											
01						72					
04						68					
07	0	UNL	45			74	60	52	46	36	5
10	4	UNL	45			87	65	53	31	04	5
13	6	200	50			95	66	51	22	21	10
16	4	UNL	50			97	66	50	20	10	6
19	3	UNL	70			89	65	53	29	32	5
22						78					

NOTES

CEILING

UNL INDICATES UNLIMITED

WEATHER

- T TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS, INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 80 07

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

FIRST CLASS

OBSERVATIONS AT 3-HOUR INTERVALS

AUGUST 1980

DAY	HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VISIBILITY WHOLE MILES	VISIBILITY 16THS MILE	WEATHER	TEMPERATURE AIR °F	TEMPERATURE WET BULB °F	TEMPERATURE DEW PT. °F	REL. HUM. %	WIND DIR	WIND SPEED KNOTS
DAY 01	01						70					
	04						67					
	07	0	UNL	45			74	60	53	48	34	4
	10	0	UNL	45			90	65	51	26	30	8
	13	3	UNL	50			99	67	50	19	23	7
	16	8	100	50			96	67	53	23	25	5
	19	8	100	50			91	67	54	29	30	4
	22						84					
DAY 02	01						73					
	04						66					
	07	0	UNL	70			75	59	49	40	32	6
	10	0	UNL	70			92	63	46	20	12	4
	13	3	UNL	70			100	66	47	17	05	5
	16	5	UNL	70			99	65	46	16	18	10
	19	0	UNL	70			93	63	46	20	35	9
	22						81					
DAY 03	01						69					
	04						65					
	07	0	UNL	70			75	57	44	33	29	6
	10	0	UNL	70			94	61	37	14	36	9
	13	0	UNL	70			98	61	35	11	33	3
	16	0	UNL	70			100	62	35	10	05	5
	19	0	UNL	70			92	60	38	15	33	10
	22						78					
DAY 04	01						65					
	04						60					
	07	0	UNL	70			70	55	45	41	32	4
	10	0	UNL	70			88	58	34	15	00	0
	13	0	UNL	70			98	61	34	11	17	14
	16	0	UNL	70			100	62	35	10	15	9
	19	0	UNL	70			89	60	41	19	16	10
	22						78					
DAY 05	01						69					
	04						62					
	07	0	UNL	70			70	53	41	35	00	0
	10	0	UNL	50			86	59	41	20	18	7
	13	0	UNL	50			94	61	40	15	15	10
	16	0	UNL	70			97	62	38	13	15	13
	19	0	UNL	70			89	57	31	12	26	9
	22						74					
DAY 06	01						64					
	04						55					
	07	5	UNL	50			62	49	38	41	03	4
	10	5	UNL	70			86	57	35	16	00	0
	13	5	UNL	50			95	59	30	10	14	5
	16	8	200	70			98	60	32	10	20	5
	19	3	UNL	70			87	58	36	16	32	7
	22						74					
DAY 07	01						67					
	04						59					
	07	5	UNL	70			72	54	40	31	30	4
	10	3	UNL	70			90	59	37	15	00	0
	13	10	190	70			97	61	34	11	20	9
	16	10	200	70			98	61	36	11	12	9
	19	9	140	70			89	61	42	19	36	10
	22						76					
DAY 08	01						70					
	04						68					
	07	8	120	70			76	59	49	39	34	3*
	10	3	UNL	70			90	61	42	19	18	6
	13	6	100	70			96	61	37	13	20	5
	16	0	UNL	70			97	60	32	10	26	7
	19	0	UNL	70			86	57	33	15	32	8
	22						73					
DAY 09	01						65					
	04						57					
	07	0	UNL	70			68	50	33	27	34	4
	10	0	UNL	70			89	57	31	12	27	3
	13	0	UNL	70			97	58	23	07	06	9
	16	0	UNL	70			99	61	31	09	29	8
	19	0	UNL	70			87	58	35	16	01	4
	22						76					
DAY 10	01						66					
	04						64					
	07	0	UNL	70			71	53	40	33	01	3
	10	0	UNL	70			90	60	40	17	20	4
	13	3	UNL	70			98	61	34	11	31	10
	16	6	100	70			99	61	32	09	20	5
	19	0	UNL	70			90	60	40	17	29	8
	22						78					
DAY 11	01						69					
	04						65					
	07	0	UNL	70			73	56	45	37	29	5
	10	0	UNL	70			91	61	42	18	29	6
	13	3	UNL	70			100	62	34	10	16	7
	16	6	100	70			103	62	33	09	34	6
	19	3	UNL	70			91	59	36	14	13	14
	22						78					
DAY 12	01						69					
	04						64					
	07	0	UNL	70			73	55	42	33	34	4
	10	0	UNL	70			92	62	43	18	27	7
	13	1	UNL	70			99	61	32	09	00	0
	16	3	UNL	70			101	62	35	10	25	9
	19	1	UNL	70			90	59	35	14	34	6
	22						78					
DAY 13	01						66					
	04						59					
	07	0	UNL	70			71	51	34	26	34	3
	10	0	UNL	70			90	58	34	14	33	3
	13	0	UNL	70			99	60	29	08	21	8
	16	0	UNL	70			100	60	28	08	08	4
	19	0	UNL	70			86	55	29	13	02	10
	22						70					
DAY 14	01						58					
	04						54					
	07	0	UNL	70			63	47	31	30	32	3
	10	0	UNL	70			83	52	18	09	22	4
	13	0	UNL	70			91	54	13	05	13	6
	16	1	UNL	70			92	56	22	08	26	14
	19	0	UNL	70			79	52	25	14	34	7
	22						71					
DAY 15	01						67					
	04						56					
	07	0	UNL	70			65	51	40	40	35	6
	10	0	UNL	70			80	56	38	22	27	6
	13	0	UNL	45			87	55	27	11	00	0
	16	0	UNL	45			88	56	28	11	19	5
	19	1	UNL	50			81	55	33	18	00	0
	22						72					
DAY 16	01						59					
	04						53					
	07	0	UNL	70			63	50	39	41	32	6
	10	0	UNL	70			81	56	35	19	28	5
	13	0	UNL	45			91	58	30	11	17	13
	16	1	UNL	45			91	58	32	12	14	14
	19	1	UNL	45			79	54	33	19	14	12
	22						71					
DAY 17	01						59					
	04						53					
	07	0	UNL	70			63	50	38	40	31	4
	10	1	UNL	45			84	57	37	19	11	6
	13	2	UNL	50			90	57	30	12	18	14
	16	3	UNL	50			90	56	26	10	18	13
	19	1	UNL	70			80	54	30	16	15	10
	22						69					
DAY 18	01						57					
	04						54					
	07	0	UNL	45			64	49	37	37	36	4
	10	0	UNL	45			81	56	37	21	23	6
	13	0	UNL	50			89	58	34	14	12	13
	16	1	UNL	70			91	57	27	10	28	11
	19	1	UNL	70			78	54	33	19	34	9
	22						67					
DAY 19	01						65					
	04						60					
	07	0	UNL	50			64	50	38	38	01	5
	10	0	UNL	50			76	54	38	25	00	0
	13	0	UNL	50			84	55	30	14	34	6
	16	0	UNL	70			87	56	30	13	27	4
	19	0	UNL	70			77	57	44	31	21	3
	22						71					
DAY 20	01						60					
	04						52					
	07	0	UNL	70			61	47	33	35	32	4
	10	0	UNL	50			80	53	29	15	01	4
	13	0	UNL	50			90	57	30	12	21	9
	16	0	UNL	70			91	58	31	12	21	11
	19	0	UNL	70			81	55	34	18	15	11
	22						74					
DAY 21	01						59					
	04						54					
	07	0	UNL	50			63	50	39	41	32	4
	10	0	UNL	45			81	56	38	21	00	0
	13	0	UNL	45			92	57	28	10	18	14
	16	0	UNL	45			91	58	33	13	17	10
	19	0	UNL	45			82	54	28	14	13	13
	22						75					
DAY 22	01						67					
	04						53					
	07	0	UNL	45			62	47	34	35	00	0
	10	0	UNL	45			80	56	38	22	17	14
	13	3	UNL	45			86	56	30	13	16	16
	16	7	100	45			83	56	33	16	17	16
	19	9	100	45			76	56	42	30	30	9
	22						67					
DAY 23	01						60					
	04						56					
	07	0	UNL	50			59	50	43	56	33	4
	10	0	UNL	50			74	54	39	28	31	5
	13	2	UNL	50			83	56	35	18	18	12
	16	6	200	45			82	55	33	17	17	13
	19	2	UNL	45			75	51	30	19	15	13
	22						66					
DAY 24	01						53					
	04						47					
	07	0	UNL	70			55	45	35	47	05	4
	10	1	UNL	50			75	51	26	16	16	4
	13	0	UNL	50			82	53	23	11	17	10
	16	4	UNL	50			84	53	22	10	17	12
	19						72					
	22						62					
DAY 25	01						52					
	04						46					
	07	0	UNL	70			57	45	34	42	31	5
	10	0	UNL	70			72	51	32	23	00	0
	13	0	UNL	70			86	55	25	11	27	4
	16	0	UNL	70			89	56	27	11	00	0
	19						76					
	22						69					
DAY 26	01						55					
	04						51					
	07	0	UNL	70			59	46	34	39	32	4
	10	0	UNL	70			80	55	35	20	36	4
	13	0	UNL	70			88	58	33	14	14	16
	16	0	UNL	45			91	58	33	13	17	12
	19						79					
	22						67					
DAY 27	01						58					
	04						50					
	07	0	UNL	70			62	49	38	41	34	5
	10	0	UNL	70			80	53	34	19	27	5
	13	0	UNL	70			88	55	25	10	16	4
	16	0	UNL	70			91	55	20	07	31	4
	19						77					
	22						66					
DAY 28	01						55					
	04						50					
	07	4	UNL	70			56	44	31	39	34	4
	10	10	UNL	70			78	52	26	15	00	0
	13	10	250	50			88	55	25	10	17	7
	16	10	250	70			90	55	20	08	36	7
	19						75					
	22						68					
DAY 29	01						60					
	04						51					
	07	6	160	50			53	42	30	41	29	4
	10	1	UNL	70			78	50	19	11	00	0*
	13	1	UNL	70			88	54	21	08	24	4
	16	4	UNL	70			87	55	25	10	23	15
	19						74					
	22						64					
DAY 30	01						59					
	04						50					
	07	0	UNL	70			59	45	31	35	00	0
	10	0	UNL	70			73	51	31	21	00	0
	13	0	UNL	70			85	54	25	11	25	4
	16	0	UNL	70			84	54	25	11	24	6
	19						71					
	22						62					
DAY 31	01						54					
	04						54					
	07	0	UNL	70			64	50	39	40	01	8
	10	6	UNL	70			76	53	34	22	02	6
	13	6	UNL	70			82	53	25	12	33	5
	16	3	UNL	70			86	56	28	12	24	4
	19						70					
	22						69					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS, INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION: BISHOP CALIFORNIA

YEAR & MONTH: 80 08

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

OBSERVATIONS AT 3-HOUR INTERVALS

SEPTEMBER 1980

Columns: HOUR | SKY COVER TENTHS | CEILING HNDS. OF FT. | VISIBILITY WHOLE MILES | VISIBILITY 16THS MILE | WEATHER | TEMPERATURE AIR °F | TEMPERATURE WET BULB °F | TEMPERATURE DEW PT. °F | REL. HUM. % | WIND DIR | WIND SPEED KNOTS

DAY 01

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						60					
04						50					
07	0	UNL	70			60	47	34	38	34	4
10	0	UNL	70			80	52	24	13	24	4
13	0	UNL	70			87	57	29	12	17	9
16	0	UNL	70			89	57	30	12	17	14
19						77					
22						67					

DAY 02

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						56					
04						51					
07	0	UNL	70			60	48	36	41	01	4
10	0	UNL	50			81	55	34	18	16	5
13	0	UNL	50			90	57	29	11	18	10
16	0	UNL	50			91	57	27	10	16	10
19						77					
22						69					

DAY 03

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						57					
04						52					
07	0	UNL	45			61	48	37	41	35	4
10	0	UNL	45			79	56	37	22	03	4
13	0	UNL	45			91	58	34	13	15	13
16	0	UNL	45			91	57	29	11	16	14
19						77					
22						67					

DAY 04

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						54					
04						50					
07	0	UNL	70			58	45	32	37	34	4
10	0	UNL	45			81	55	33	18	30	4
13	0	UNL	70			90	57	30	12	19	17
16	0	UNL	70			91	57	27	10	16	4
19						78					
22						70					

DAY 05

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						55					
04						52					
07	0	UNL	50			61	48	36	39	03	4
10	0	UNL	70			81	55	33	18	00	0
13	1	UNL	50			92	61	37	14	16	8
16	10	100	45			84	59	41	22	21	7
19						73					
22						65					

DAY 06

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						57					
04						52					
07	0	UNL	70			62	52	44	52	00	0
10	0	UNL	70			80	59	45	29	00	0
13	4	UNL	50			88	60	41	19	17	14
16	8	200	70			85	59	42	22	15	13
19						74					
22						67					

DAY 07

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						62					
04						59					
07	8	100	50			63	54	48	58	36	4
10	3	UNL	70			80	57	42	26	01	7
13	10	65	35		TRW	60	55	52	75	34	13
16	9	70	70			58	52	47	67	33	16
19						52					
22						46					

DAY 08

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						45					
04						42					
07	0	UNL	70			50	46	43	77	30	4
10	0	UNL	70			67	54	44	44	36	4
13	6	100	50		RW	70	56	46	42	09	4
16	5	UNL	50			79	55	36	21	08	10
19						68					
22						57					

DAY 09

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						49					
07	6	250	50			54	50	47	77	31	5
10	8	100	50		TRW	67	54	45	45	27	6
13	9	100	40			73	54	38	28	25	13
16	9	100	40			76	55	44	32	29	9
19						65					
22						56					

DAY 10

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						50					
04						46					
07	1	UNL	70			50	47	44	80	00	0
10	6	95	70			68	53	42	39	03	4
13	2	UNL	50			77	55	38	25	00	0
16	3	UNL	50			80	55	34	19	22	5
19						65					
22						62					

DAY 11

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						49					
07	0	UNL	70			57	50	44	62	35	4
10	0	UNL	70			73	55	42	33	25	4
13	0	UNL	70			81	56	37	21	27	4
16	6	100	50			83	57	36	19	27	5
19						69					
22						67					

DAY 12

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						61					
04						56					
07	3	UNL	70			61	52	46	58	28	5
10	0	UNL	70			78	57	44	30	02	4
13	6	100	70			86	58	38	18	16	14
16	3	UNL	70			86	57	34	16	23	11
19						70					
22						63					

DAY 13

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						45					
07	0	UNL	70			52	42	32	47	03	4
10	6	180	70			80	53	27	14	16	13
13	3	UNL	70			86	54	20	09	20	14
16	7	160	70			83	52	19	09	24	23
19						66					
22						65					

DAY 14

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						62					
04						60					
07	5	UNL	70			60	44	24	25	22	6
10	3	UNL	70			71	48	20	14	16	18
13	10	UNL	50			78	50	17	10	16	14
16	10	UNL	45			79	50	17	10	17	14
19						66					
22						62					

DAY 15

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						57					
04						43					
07	0	UNL	70			51	42	33	50	06	4
10	8	UNL	70			70	50	32	25	00	0
13	9	150	70			80	52	25	13	16	14
16	10	200	70			81	51	20	10	17	18
19						68					
22						62					

DAY 16

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						47					
04						43					
07	0	UNL	70			51	40	27	39	34	4
10	0	UNL	70			73	50	25	17	34	4
13	0	UNL	70			82	54	29	14	01	6
16	0	UNL	70			87	56	30	13	12	7
19						74					
22						60					

DAY 17

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						54					
04						56					
07	3	UNL	50			59	50	43	56	00	0
10	5	UNL	70			78	57	42	28	29	4
13	4	UNL	70			90	62	45	21	14	14
16	4	UNL	50			91	62	45	20	18	9
19						75					
22						65					

DAY 18

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						63					
04						67					
07	1	UNL	70			63	52	43	48	30	6
10	8	160	70			76	59	49	39	32	4
13	7	160	70			85	55	29	13	26	4
16	8	150	70			93	56	21	07	25	14
19						76					
22						63					

DAY 19

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						52					
04						53					
07	0	UNL	45			59	47	35	41	29	6
10	0	UNL	45			76	52	28	17	03	11
13	0	UNL	70			79	53	29	16	36	8
16	0	UNL	70			81	53	27	14	33	4
19						67					
22						54					

DAY 20

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						47					
04						45					
07	0	UNL	70			51	41	30	45	30	6
10	0	UNL	70			72	52	35	26	34	4
13	0	UNL	70			81	54	30	16	17	13
16	0	UNL	70			83	55	32	16	29	4
19						69					
22						62					

DAY 21

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						55					
04						54					
07	0	UNL	70			57	47	37	47	36	18
10	0	UNL	70			68	51	36	31	01	10
13	0	UNL	70			75	52	32	21	33	9
16	0	UNL	70			77	52	29	17	23	6
19						62					
22						54					

DAY 22

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						51					
04						46					
07	0	UNL	70			50	41	32	50	29	5
10	0	UNL	70			69	49	31	24	27	6
13	0	UNL	70			77	53	32	19	27	6
16	0	UNL	70			80	53	29	15	26	7
19						67					
22						54					

DAY 23

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						53					
04						45					
07	0	UNL	70			52	41	29	41	33	7
10	0	UNL	70			74	50	25	16	28	8
13	0	UNL	70			83	53	22	10	33	4
16	0	UNL	70			85	54	25	11	25	6
19						68					
22						60					

DAY 24

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						56					
04						47					
07	0	UNL	70			51	40	28	41	33	4
10	0	UNL	70			74	50	25	16	29	8
13	0	UNL	70			85	54	24	11	18	4
16	0	UNL	70			88	55	25	10	18	9
19						70					
22						56					

DAY 25

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						49					
04						45					
07	1	UNL	70			53	41	28	38	34	6
10	1	UNL	70			77	51	26	15	00	0
13	6	UNL	70			88	55	24	10	18	14
16	1	UNL	70			87	55	25	10	17	11
19						75					
22						58					

DAY 26

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						51					
04						48					
07	9	150	50			53	43	32	45	34	5
10	7	250	50			74	51	28	18	12	5
13	1	UNL	50			88	55	24	10	17	5
16	0	UNL	70			89	57	30	12	17	8
19						72					
22						59					

DAY 27

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						54					
04						47					
07	0	UNL	70			53	42	30	41	35	4
10	0	UNL	45			76	53	33	21	00	0
13	0	UNL	45			88	56	26	10	18	17
16	0	UNL	70			88	56	30	12	16	14
19						73					
22						57					

DAY 28

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						51					
04						50					
07	0	UNL	70			55	42	27	34	32	4
10	0	UNL	70			77	51	24	14	03	5
13	0	UNL	70			86	54	23	10	26	6
16	0	UNL	70			90	55	22	08	27	6
19						67					
22						61					

DAY 29

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						58					
04						45					
07	0	UNL	70			55	42	26	33	00	0
10	0	UNL	70			79	51	23	12	30	5
13	0	UNL	70			89	55	24	09	22	7
16	0	UNL	70			92	57	26	09	24	5
19						69					
22						54					

DAY 30

HOUR	SKY COVER TENTHS	CEILING HNDS. OF FT.	VIS. WHOLE MILES	VIS. 16THS MILE	WEATHER	AIR °F	WET BULB °F	DEW PT. °F	REL. HUM. %	DIR	SPEED KNOTS
01						49					
04						47					
07	0	UNL	70			53	41	26	35	30	4
10	0	UNL	70			80	53	28	15	28	4
13	0	UNL	70			91	57	27	10	22	6
16	0	UNL	70			93	57	25	09	23	5
19						66					
22						56					

NOTES

CEILING

UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS, INDICATED IN TENS OF DEGREES FROM TRUE NORTH: I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION

BISHOP CALIFORNIA

YEAR & MONTH

80 09

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

FIRST CLASS

OCTOBER 1980

OBSERVATIONS AT 3-HOUR INTERVALS

Day	Hour	Sky Cover Tenths	Ceiling Hnds. of Ft.	Visibility Whole Miles	Visibility 16ths Mile	Weather	Air °F	Wet Bulb °F	Dew Pt. °F	Rel. Hum. %	Wind Dir	Wind Speed Knots
01	01						50					
01	04						50					
01	07	0	UNL	70			54	42	29	38	31	6
01	10	0	UNL	70			82	55	31	16	28	4
01	13	0	UNL	70			93	58	29	10	17	6
01	16	0	UNL	70			95	59	30	10	27	4
01	19						72					
01	22						62					
02	01						53					
02	04						49					
02	07	0	UNL	70			58	45	31	36	30	7
02	10	0	UNL	70			82	55	31	16	26	7
02	13	0	UNL	70			92	58	31	11	31	4
02	16	0	UNL	70			94	58	26	09	22	4
02	19						75					
02	22						59					
03	01						56					
03	04						50					
03	07	0	UNL	70			58	45	32	37	30	6
03	10	0	UNL	70			82	55	33	17	21	4
03	13	0	UNL	70			93	58	30	11	00	0
03	16	0	UNL	70			93	59	31	11	23	6
03	19						75					
03	22						62					
04	01						55					
04	04						50					
04	07	0	UNL	45			54	44	34	47	32	5
04	10	0	UNL	30			80	55	34	19	00	0
04	13	0	UNL	30			91	60	38	15	00	0
04	16	0	UNL	30			91	58	32	12	18	6
04	19						70					
04	22						60					
05	01						55					
05	04						51					
05	07	0	UNL	40			51	43	34	52	33	4
05	10	0	UNL	40			80	55	35	20	33	4
05	13	0	UNL	50			90	57	31	12	17	8
05	16	0	UNL	45			90	57	29	11	17	13
05	19						71					
05	22						57					
06	01						52					
06	04						49					
06	07	0	UNL	70			54	42	30	40	35	4
06	10	0	UNL	45			79	54	34	20	29	3
06	13	0	UNL	45			91	57	29	11	22	5
06	16	0	UNL	45			90	58	32	13	23	6
06	19						66					
06	22						55					
07	01						54					
07	04						47					
07	07	0	UNL	70			54	44	33	45	34	3
07	10	0	UNL	70			79	53	29	16	31	5
07	13	0	UNL	70			89	57	31	12	30	4
07	16	0	UNL	70			90	57	31	12	31	5
07	19						66					
07	22						58					
08	01						50					
08	04						48					
08	07	0	UNL	70			56	43	29	36	31	6
08	10	0	UNL	70			78	53	31	18	00	0
08	13	0	UNL	70			89	57	31	12	00	0
08	16	0	UNL	70			90	57	30	12	30	4
08	19						63					
08	22						55					
09	01						51					
09	04						47					
09	07	0	UNL	45			51	42	32	48	31	6
09	10	0	UNL	20			77	54	33	20	02	4
09	13	0	UNL	45			89	57	29	11	17	14
09	16	0	UNL	70			89	56	28	11	17	11
09	19						73					
09	22						55					
10	01						48					
10	04						45					
10	07	0	UNL	50			50	40	28	43	34	4
10	10	0	UNL	50			75	52	32	21	00	0
10	13	0	UNL	40			86	60	43	22	16	15
10	16	0	UNL	35			84	56	33	16	16	18
10	19						73					
10	22						67					
11	01						50					
11	04						42					
11	07	0	UNL	70			48	40	31	52	33	5
11	10	0	UNL	50			72	51	32	23	14	3
11	13	0	UNL	50			79	50	17	10	14	4
11	16	3	UNL	50			80	51	21	11	17	9
11	19						66					
11	22						60					
12	01						55					
12	04						50					
12	07	3	UNL	50			56	44	32	40	01	11
12	10	2	UNL	50			72	50	29	20	22	11
12	13	0	UNL	50			76	49	16	10	27	9
12	16	0	UNL	70			74	49	21	14	31	9
12	19						56					
12	22						45					
13	01						41					
13	04						35					
13	07	0	UNL	70			38	33	24	57	33	5
13	10	2	UNL	70			64	45	24	22	18	8
13	13	0	UNL	70			73	47	10	09	13	5
13	16	0	UNL	70			72	47	15	11	27	16
13	19						55					
13	22						52					
14	01						49					
14	04						43					
14	07	4	UNL	70			45	39	32	60	36	9
14	10	5	UNL	70			58	43	27	31	36	15
14	13	9	70	70			56	42	24	29	01	15
14	16	8	80	45			55	41	23	29	30	7
14	19						44					
14	22						40					
15	01						36					
15	04						38					
15	07	8	UNL	70			42	36	29	60	36	12
15	10	7	70	70			51	39	22	32	02	15
15	13	5	UNL	70			55	40	19	24	36	13
15	16	8	80	45			48	37	24	39	36	17
15	19						42					
15	22						38					
16	01						32					
16	04						28					
16	07	10	35	50			32	29	24	72	00	0
16	10	10	110	50			47	36	21	36	00	0
16	13	10	100	40			54	39	18	24	18	4
16	16	8	140	50			54	41	25	33	25	5
16	19						47					
16	22						36					
17	01						31					
17	04						28					
17	07	0	UNL	70			30	26	20	66	29	5
17	10	0	UNL	70			52	40	24	34	35	7
17	13	0	UNL	70			60	42	19	20	30	7
17	16	0	UNL	70			62	44	24	23	27	8
17	19						49					
17	22						42					
18	01						35					
18	04						30					
18	07	1	UNL	70			37	31	23	57	30	9
18	10	0	UNL	70			61	43	19	20	02	7
18	13	0	UNL	70			67	46	22	18	32	6
18	16	4	UNL	70			70	48	23	17	25	5
18	19						50					
18	22						41					
19	01						35					
19	04						35					
19	07	0	UNL	70			35	30	23	62	34	4
19	10	0	UNL	70			63	45	24	23	29	7
19	13	0	UNL	70			71	49	27	19	35	7
19	16	0	UNL	70			73	48	18	12	24	4
19	19						58					
19	22						43					
20	01						37					
20	04						36					
20	07	0	UNL	70			36	31	23	59	35	5
20	10	0	UNL	70			63	45	24	23	00	0
20	13	0	UNL	70			74	50	26	17	14	7
20	16	2	UNL	70			75	50	24	15	22	4
20	19						54					
20	22						40					
21	01						37					
21	04						34					
21	07	1	UNL	70			36	30	22	57	34	5
21	10	0	UNL	70			62	45	26	25	28	4
21	13	4	UNL	70			74	49	21	14	18	6
21	16	8	UNL	70			73	49	23	15	15	6
21	19						56					
21	22						45					
22	01						38					
22	04						37					
22	07	3	UNL	70			44	36	26	49	30	4
22	10	2	UNL	70			66	48	30	26	32	7
22	13	1	UNL	70			73	50	28	19	00	0
22	16	0	UNL	70			74	50	25	16	00	0
22	19						55					
22	22						50					
23	01						43					
23	04						35					
23	07	0	UNL	70			37	32	24	59	00	0
23	10	0	UNL	70			64	45	24	22	00	0
23	13	0	UNL	70			75	51	28	18	20	6
23	16	7	UNL	70			75	50	22	14	20	6
23	19						65					
23	22						44					
24	01						37					
24	04						36					
24	07	8	UNL	70			36	31	24	62	02	4
24	10	6	UNL	70			62	45	26	25	00	0
24	13	7	UNL	70			74	50	26	17	17	16
24	16	6	UNL	70			73	48	17	12	17	10
24	19	1	UNL	15			57	42	21	25	14	6
24	22						48					
25	01						35					
25	04						34					
25	07	8	200	50			35	29	17	48	00	0
25	10	8	140	50			56	41	22	27	00	0
25	13	9	130	50			65	45	21	19	17	10
25	16	9	110	50			65	46	28	25	28	7
25	19	5	UNL	15			57	44	29	34	03	7
25	22						53					
26	01						46					
26	04						44					
26	07	0	UNL	70			44	37	28	53	34	16
26	10	0	UNL	70			56	40	15	20	35	19
26	13	0	UNL	70			60	41	13	16	35	19
26	16	1	UNL	70			62	43	20	20	36	18
26	19	0	UNL	15			54	40	21	28	34	13
26	22						47					
27	01						47					
27	04						48					
27	07	1	UNL	70			50	39	25	38	35	16
27	10	0	UNL	70			55	42	25	31	03	16
27	13	0	UNL	70			60	42	18	19	01	16
27	16	10	UNL	70			60	41	11	14	36	15
27	19	2	UNL	15			50	36	13	23	01	16
27	22						44					
28	01						36					
28	04						38					
28	07	0	UNL	70			30	25	18	61	28	5
28	10	0	UNL	70			53	39	18	25	35	10
28	13	0	UNL	70			61	42	15	16	28	4
28	16	0	UNL	70			65	43	11	12	24	5
28	19	0	UNL	15			45	34	15	30	00	0
28	22						34					
29	01						30					
29	04						27					
29	07	0	UNL	70			28	23	12	51	34	4
29	10	0	UNL	70			58	40	12	16	00	0
29	13	0	UNL	70			68	45	14	12	16	5
29	16	0	UNL	70			70	45	12	10	18	5
29	19	0	UNL	20			43	32	14	31	30	6
29	22						33					
30	01						28					
30	04						26					
30	07	7	UNL	70			26	21	09	48	02	5
30	10	8	UNL	70			56	37	09	15	04	4
30	13	9	UNL	70			69	45	11	10	00	0
30	16	10	200	70			68	46	17	14	15	8
30	19	10	200	20			50	36	15	25	36	4
30	22						43					
31	01						39					
31	04						36					
31	07	10	200	70			36	29	17	46	36	4
31	10	10	200	70			57	40	15	19	00	0
31	13	4	UNL	70			68	46	18	15	22	9
31	16	0	UNL	70			69	46	18	14	16	9
31	19	0	UNL	20			48	37	21	34	02	7
31	22						34					

NOTES

CEILING
UNL INDICATES UNLIMITED

WEATHER

- * TORNADO
- T THUNDERSTORM
- Q SQUALL
- R RAIN
- RW RAIN SHOWERS
- ZR FREEZING RAIN
- L DRIZZLE
- ZL FREEZING DRIZZLE
- S SNOW
- SP SNOW PELLETS
- IC ICE CRYSTALS
- SW SNOW SHOWERS
- SG SNOW GRAINS
- IP ICE PELLETS
- A HAIL
- F FOG
- IF ICE FOG
- GF GROUND FOG
- BD BLOWING DUST
- BN BLOWING SAND
- BS BLOWING SNOW
- BY BLOWING SPRAY
- K SMOKE
- H HAZE
- D DUST

WIND

DIRECTIONS ARE THOSE FROM WHICH THE WIND BLOWS, INDICATED IN TENS OF DEGREES FROM TRUE NORTH; I.E., 09 FOR EAST, 18 FOR SOUTH, 27 FOR WEST. ENTRY OF 00 IN THE DIRECTION COLUMN INDICATES CALM.

SPEED IS EXPRESSED IN KNOTS; MULTIPLY BY 1.15 TO CONVERT TO MILES PER HOUR.

STATION
BISHOP CALIFORNIA

YEAR & MONTH
80 10

U.S. DEPARTMENT OF COMMERCE
NATIONAL CLIMATIC CENTER
FEDERAL BUILDING
ASHEVILLE, N.C. 28801

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-210

U.S.MAIL

FIRST CLASS

UCD-ARB INVESTIGATION OF AIR QUALITY IN THE OWENS VALLEY

OWENS VALLEY SOIL RESUSPENSION STUDY

PARTICULATE CONCENTRATIONS IN NANOGRAMS/CUBIC METER

COARSE PARTICLES (2.5 TO 15 MICRONS)

	S	PB	BR	AL	SI	K	CA	TI	MN	FE	ZN	V	NA	CL	SE
TINEMAHA RESERVOIR	94*	61*	37	80	1453	223	368	61	33	322	14	29*	793*	95*	25*
OWENS LAKE BED	45	83	30*	61	819	154	249	32*	27	188	59	38	1399	105*	24*
MONO LAKE BED	175	74	27*	169*	129*	33	58	28	24	76	13*	37	689*	85*	21*
MONO LAKE BED	105*	145	36*	150	1540	410	818	138	50	1137	40	37	4082	104*	28*
LITTLE LAKE	143*	102*	54*	296*	23427	2174	4601	580	142	5562	75	45*	1208*	144*	42*
CARTEGO	185*	176	78*	383*	10665	1215	1872	254	101	1577	64	57*	1820	188*	61*
OWENS LAKE BED	155*	154*	81*	412	2838	360	2634	38	44	528	27	47*	1305*	157*	63*
OWENS LAKE BED	351	281*	147*	802	6590	1238	5672	155	46	1444	116	77*	11874	1250	115*
KEELER	110*	1424	37*	228*	10783	1007	4856	140	61	3336	282	34*	932*	112*	29*
KEELER	134*	1441	45*	278*	15153	1325	5650	195	72	3420	340	41*	1135*	136*	35*
KEELER	151*	867	51*	312*	18461	1656	9568	144	68	2572	227	46*	1273*	152*	76
INDEPENDENCE	187*	125*	65*	385*	23431	4629	5548	811	252	9157	154	58*	1634	189*	51*
TINEMAHA RESERVOIR	153*	172	57*	2083	11967	1237	1409	176	51	1768	70	46*	7965	154*	44*
BIG PINE	171*	582	68	3360	21861	3694	4903	681	152	6825	136	60	4631	173*	49*
BIG PINE	115*	167	42*	239*	20930	2415	3482	309	91	2992	22	37*	977*	117*	33*
BIG PINE	163*	124	36*	1282	4372	708	770	139	33	1150	38	35*	4635	119*	28*
BISHOP	169*	114*	60*	351*	39998	4132	4229	618	139	6209	99	54*	1434*	171*	47*
MONO LAKE BED	168*	520	60*	2747	20499	3771	6000	531	149	5692	305	55	7269	171*	47*
MONO LAKE BED	135*	121	47*	279*	19855	1466	1765	157	54	1913	44	41*	1142*	136*	37*
MONO LAKE BED	104*	79*	41*	215*	1486	447	252	58	33	237	21	61	3304	106*	37*
MONO LAKE BED	194	60*	41	98	426	57	233	80	35	125	17	35*	1015	116*	25*

* DENOTES UPPER LIMIT OF ELEMENT NOT FOUND

Reprinted from ACS SYMPOSIUM SERIES, No. 167
ATMOSPHERIC AEROSOL: SOURCE/AIR QUALITY RELATIONSHIPS
Edward S. Macias and Philip K. Hopke, Editors

18

The Effect of Owens Dry Lake on Air Quality in the Owens Valley with Implications for the Mono Lake Area

J. B. BARONE, L. L. ASHBAUGH, B. H. KUSKO, and T. A. CAHILL

Air Quality Group, Crocker Nuclear Laboratory and Department of Physics, University of California—Davis, Davis, CA 95616

The suspension of aerosols during dust storms from the Owens Dry Lake in California has been a subject of great concern to residents in the Owens Valley. In order to assess the magnitude and extent of aerosols from the lake bed, we measured ambient aerosol concentrations by size, mass, and elemental concentrations at seven sites in the Owens Valley from February 20 to June 18, 1979. Resuspended samples of material from Owens Lake bed were used to determine the lake bed source signature. The most important effect we measured was a significant increase in sulfate aerosols as far as twenty-five miles downwind of the lake bed. A substantial increase in gravimetric mass was measured during dust storms for particles in the 2.5–15μm size range. No significant increase in mass was measured for particles in the 0.1–2.5μm size range. Similar measurements on a more limited scale at Mono Lake showed that the sulfur to iron ratio at Mono Lake is a factor of 6–8 greater than the ratio at Owens Lake. These results are consistent with the known mechanism of sulfate formation (efflorescence) in alkaline lake beds. The data indicate that Mono Lake has the potential to become a significant source of sulfate aerosols if the lake bed areas are exposed.

The Owens Valley lies in east central California between the Sierra Nevadas to the west and the Inyo-White Mountains to the east. The valley is 120 miles long, but only seventeen miles across at its widest point. While the valley floor lies at an elevation of approximately 4,000 feet, the mountains on either side tower to 12–14,000 feet. This topography is important for two reasons. First, the Sierra Nevadas create a rain shadow

commonly associated with the development of saline lakes (1). In fact, several saline lakes and playas exist in the vicinity, including Owens Dry Lake, Mono Lake, Saline Valley, Deep Springs Lake, Death Valley, and Searles Lake. Second, the high mountains on either side constrain the transport of airborne contaminants within the valley, effectively trapping them until they exit at the north or south end. Furthermore, the mountains may serve to increase wind speeds at the valley surface due to local chinooks and venturi flow effects between the valley walls (2). This effect could enhance development of dust storms in the valley (3).

In recent years, the importance of the Owens Lake bed on air quality in the Owens Valley has been a subject of much concern and debate. The extent to which the lake bed aerosols are transported, as well as whether or not toxic substances are present in the lake bed soils, has been questioned by residents and regulatory agencies. Although air quality in the basin is generally quite good, at some times during the year, particulate aerosol concentrations are high. In particular, dust storms occur during windy periods, which cause poor visibility and may lead to health problems (2).

In order to obtain quantitative data on particulate air quality in the Owens Valley, a study sponsored by the California Air Resources Board was conducted by the Air Quality Group at UCD. The primary objective was to determine the impact of the dry lake bed on the average particulate concentration and on the dust storm particulate concentrations in the valley. In order to accomplish this, it was necessary to determine the elemental composition of the dry lake bed and to determine the average weekly and dust storm concentration of aerosols.

The objectives were met by a study plan designed to acquire data for seventeen weeks at seven sites throughout the valley. This included both weekly monitoring and daily intensive sampling of aerosols. The samples were weighed and then analyzed for elemental composition on the UC Davis cyclotron.

It should be noted that the sampler used in the study, (a stacked filter unit), collected only particles less than 15μm aerodynamic diameter, i.e. particles of respirable size. State standards for TSP are based on High Volume samplers which have no inlet cutoff. Hence, particles as large as 100 microns can be captured by these instruments. Therefore, measurements made in this study may not indicate whether particulate standards have been violated, since a significant portion of the total suspended particulate mass is not measured by the stacked filter unit (SFU).

Particle Sampling and Analysis

The particle sampler chosen for this study was the Stacked Filter Unit (SFU) described by Cahill *et al* (4,5). Particle collection in two size fractions was achieved by placing two Nuclepore membrane filters in series. The first filter, with 8μm diameter pores, has a 50% collection efficiency for 2.5μm diameter particles. The filters were coated with a thin layer of Apiezon type L grease to minimize particle bounce-off and loss in transport. The SFU was fitted with an inlet which excluded particles larger than 15μm. The second filter was a 0.4μm pore diameter Nuclepore filter, which collected all particles less than 2.5μm. A diagram of the SFU is shown in Figure 1, and the collection efficiency of each stage is shown in Figure 2. Also shown is the bimodal "Pasadena" particle size distribution (6), and the collection efficiency of the human upper respiratory tract (7). The SFU thus collects particles in two size fractions closely resembling the fractions deposited in the upper and lower respiratory tracts, and also separates the coarse, naturally generated particles from the finer anthropogenic particles.

The aerosol samples collected by the SFU were analyzed both gravimetrically for total suspended particulate mass less than 15μm, and by particle induced x-ray emission (PIXE) for elemental content. The filters were weighed before and after sampling using a Cahn 25 electrobalance sensitive to 1μg. Typical precision of TSP determined by this analytical method is ±0.5μg/m^3 for samples collected under conditions of low aerosol concentrations (5). After weighing, the filters were analyzed for elemental content (elements heavier than Na) using the UC Davis PIXE system. This analysis technique is described in Cahill et al (8).

Study Design

Weekly monitoring of particulate aerosols began on February 20, 1979, and ended on June 18, 1979. A total of seventeen weeks of monitoring were conducted during this period. Samplers were run for seven consecutive days each week at a flow rate of ten liters per minute, except during dust storm episodes. During dust storms, samples were collected daily at a flow rate of ten liters per minute. Samples during dust storms were collected on April 6,7,16,17,23,24, 1979.

In addition, data on wind flow collected at Bishop was examined. This station measured wind speed and direction between 7 AM and 7 PM. However, these data may not be representative of the flow regime at the Lake since they do not include a complete 24-hour record and are a significant distance from the dry lake.

The sampling sites were chosen in order to investigate the spatial distribution of particulate pollutants in the valley. As an additional consideration, sites were selected to coincide with the major population centers in the valley in order to determine the concentration of respirable aerosols to which valley residents are exposed on a daily basis. Seven of the sampling sites were in the Owens Valley itself, and one site was in the Mono Lake area. Site 1 was located near the Bishop Airport at the National Weather Service Meteorological station. This site is about five miles east of downtown Bishop in the center of the

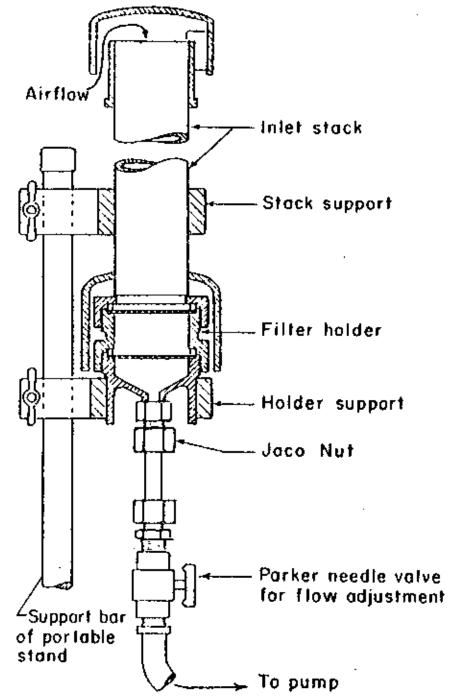


Figure 1. Schematic of the stacked filter unit showing the inlet and the 2-stage filter holder

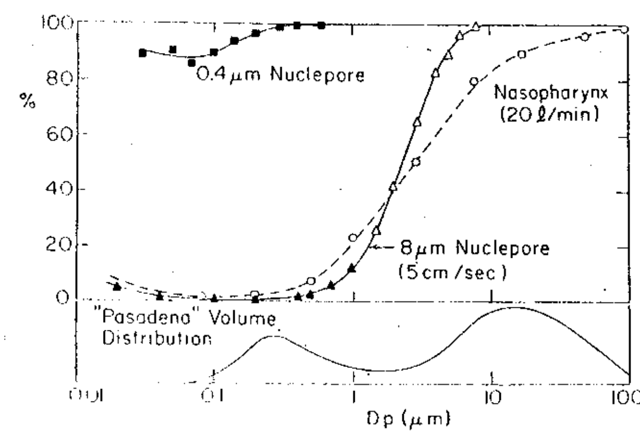


Figure 2. Particle capture efficiencies of 8.0-μm and 0.4-μm Nuclepore filters for a face velocity of 5 cm/s.

Also shown is the capture efficiency of the human upper respiratory tract (nasopharynx). Closed symbols are derived from data on capture efficiency using monodispersed aerosols; open symbols are theoretical calculations (see Ref. 4). The lower section of the diagram is a schematic of the "Pasadena" bimodal distribution.

valley. Site 2 was located in Big Pine near the western edge of the valley. The Independence courthouse was the location of Site 3. This site was in the center of Independence near Highway 395. Site 4 was located at the Lone Pine High School on the southeast side of town. This site is about ten miles north of Owens Dry Lake. The Keeler Post Office was chosen for Site 5. This site was on the eastern edge of Owens Dry Lake. Site 6 was located at Cartago on the western side of Owens Dry Lake. Site 7 was located approximately twenty-five miles south of Owens Dry Lake at Little Lake. Figure 3 is a map of the study area depicting the seven sampling sites in the valley. Site 8 was located at Lee Vining in the Mono Lake area on the northwestern edge of Mono Lake.

All eight sampling sites were operated by local residents. Preweighed filters were placed in filter holders at U.C. Davis and shipped via U.P.S. to each site. The local operator would measure the flow before and after sampling with a spirometer calibrated orifice meter, and then return this information with the exposed filters. Upon arrival at U.C.D., filters were post-weighed and prepared for x-ray analysis.

Results

Average Weekly Concentration of Aerosols. The weekly monitoring data colleted in this study provided an excellent means by which the profile of pollutants in the valley could be determined. Figure 4 is a profile of the average total and fine gravimetric mass measured at each site in the basin. The error bars represent the standard error of the mean. A map of the study area is included at the bottom of the figure to provide a better understanding of the relationship between topography and the measured pollutant concentrations. The dominant characteristic of this profile is the marked peak in total mass at the Keeler sampling site. This peak, coupled with the decreasing total mass values measured farther north from the dry lake bed, suggests that the dry lake bed is a significant source of coarse aerosols. The fine aerosol mass does not follow the same pattern as the total mass, suggesting that the lake bed may not be a significant source of fine aerosols. A similar profile depicting selected trace elements is shown in Figure 5. The error bars here are again the standard error of the mean. Silicon and iron are usually soil-derived aerosols, while sulfur is generally produced by gas to particle conversion of sulfur dioxide to sulfate aerosols or by direct production of sulfates through the burning of fossil fuels. The source of iron and silicon in the Owens Valley appears to be local soil material with only slight enhancement due to the dry lake bed. There is no anthropogenic source of coarse sulfur aerosols near the dry lake. Thus, these aerosols are being suspended from the dry lake bed.

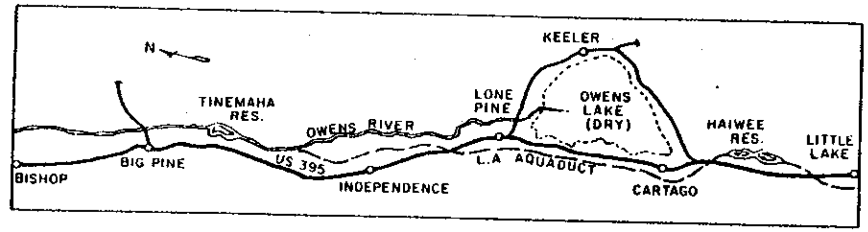


Figure 3. Map of the Owens Valley with the aerosol sampling sites indicated by (O)

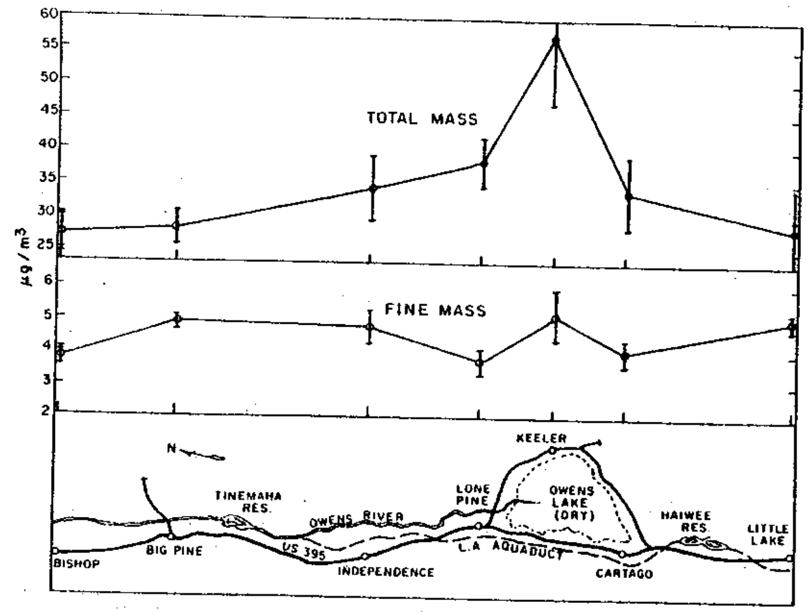


Figure 4. Average for all weeks of aerosol mass less than 15.0 μm (total mass) and mass less than 2.5 μm (fine mass) at each sampling site. A map of the sampling sites is included at the bottom of the figure. Error bars represent standard error of the mean.

Effect of Dust Storm Episodes on the Average Weekly Aerosol Concentrations. The total and fine gravimetric mass averaged over all sites for each week, is depicted in Figure 6. The error bars for the Owens Valley curves represent the standard deviation of the mean. The errors on the Mono Lake curve represent the sampling system error of ±15%. The mean weekly values do not include the three dust storm episodes sampled separately, but do include several additional dust storms. Table I lists all the dust storms reported by the sampler operators.

The Fine Gravimetric Mass is virtually unchanged over the monitoring period. The Total Gravimetric Mass (TGM) measurements, however, illustrate several important points. First, a general upward trend from winter to summer is observed. This trend has been observed in data from other sites in Utah and can be attributed to higher levels of soil aerosols suspended in the atmosphere as the soil surface dries out. Superimposed on the general trend, however, are peaks of TGM which are a factor of 1.3 to 2.3 times the non-peak levels. Each of the peaks corresponds to a dust storm or high winds period as shown in Table I. Furthermore, the dust storm episodes which were sampled separately in the first, third, and fourth weeks of April, would raise the TGM in those periods by a factor of 1.7. It should be noted that the third week of April already includes one dust storm period which was not sampled separately. Finally, although it is difficult to draw inferences from these data about the persistence of suspended dust after the storm, the frequency of occurrence of elevated TGM levels is well documented. During the seventeen week monitoring period, nine weeks exhibit elevated TGM levels if the separate dust storm samples are included in the weekly average values. Hence, these data indicate that dust storm episodes have a significant impact on the average aerosol concentration in the Owens Valley.

Magnitude and Spatial Extent of Lake Bed Aerosols. The magnitude and spatial extent of the contribution of lake bed aerosols to the measured atmospheric aerosol concentration in the valley can be identified using data from the intensive dust storm sampling program, the weekly monitoring study, and the lake bed soil sample analysis. Gravimetric mass and four elements, sulfur, chlorine, silicon, and iron, were selected for analysis. Based upon data obtained by resuspending lake bed and sampling site soil samples, two elements (sulfur and chlorine) were identified as being primarily generated in the valley from resuspended lake bed materials. The coarse aerosol fraction (15μm to 2.5μm) of these elements is a good tracer of lake bed materials for three reasons. First, since these elements were only found in lake bed soil samples, no other "natural" source of these aerosols is likely to exist in the valley. Second, since the only anthropogenic source of sulfur aerosols in the valley (automotive exhaust) would produce fine particle sulfur, (<2.5μm), and since

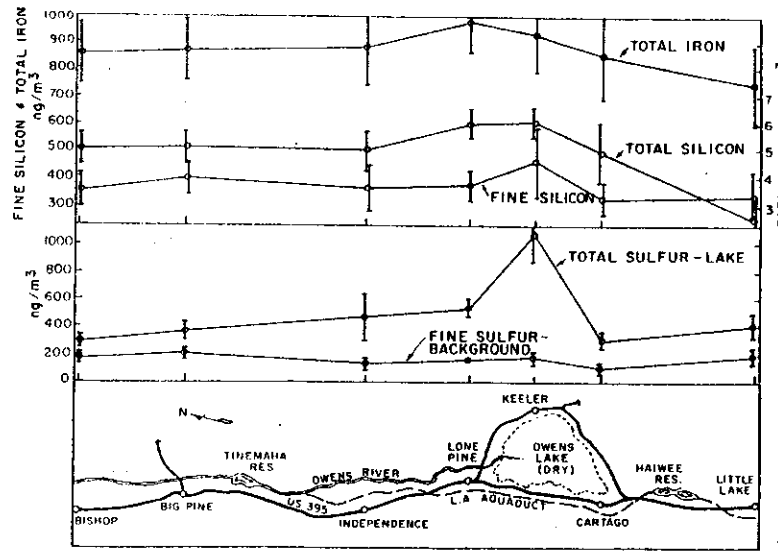


Figure 5. Average weekly concentration at each sampling site for total Fe, Si, and S (particles less than 15 μm) and fine Si and S (particles less than 2.5 μm). Error bars represent standard error of the mean.

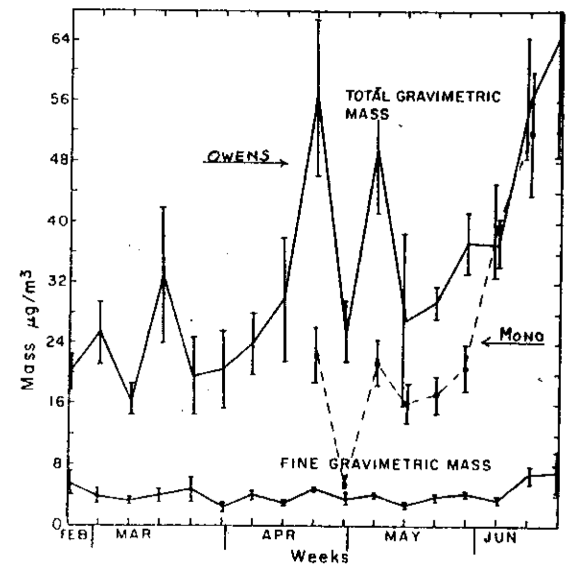


Figure 6. Average total mass (particles less than 15 μm) and fine mass (particles less than 2.5 μm) for all Owens Valley sampling sites for each sampling week.

Error bars are standard error of the mean. Also included for reference is the weekly mass concentration measured at the Mono Lake sampling site. Error bars are ±15% measurement system error.

TABLE I. WEATHER OBSERVATIONS FROM OPERATORS

DATE	MONITORING PERIOD AFFECTED (Month,Week)	OBSERVATIONS NOTED BY SAMPLER OPERATOR
2/26 - 2/21	February, 1	Rain, snow at Big Pine
3/01 - 3/02	March, 1	Dust, North wind
3/15	March, 3	Dust, South wind
3/18, 3/19	March, 3	Heavy rain
4/07 - 4/08	*	Dust storm
4/16	April, 2	High wind at Lone Pine
4/17 - 4/18	*	Dust storm
4/21 - 4/22	April, 3	Big dust storm
4/24	*	Dust storm
5/05	May, 1	Dust, high winds
5/26	May, 4	Dust at Lone Pine
6/15 - 6/18	June, 3	High winds at Big Pine

* These dust storm aerosol measurements are not included in the weekly average concentration in Figure 7.

there is no anthropogenic source of chlorine in the valley, man-made emissions of coarse particle sulfur or chlorine is negligible. Finally, since long-range transport of coarse particles is unlikely due to the short residence time of these large particles in the atmosphere, long-range transport from outside the basin is not an important source of coarse particle sulfur or chlorine.

Silicon and iron are generally considered to be tracers of resuspended soils. For this reason, they were included in the analysis to determine the importance of local soils on the measured aerosol concentration.

Figures 4 and 7 indicate the spatial profile of total and fine aerosol mass for the weekly monitoring and the dust storm episode studies, respectively. The total mass concentration peaks at Keeler and declines sharply north of the lake bed. These figures indicate that lake bed aerosols are transported in significant concentrations to Independence. A similar trend is shown in Figure 8 for total sulfur and coarse silicon and iron concentrations during a dust storm. The error bars on Figure 7 and 8 represent the sampling system error of ±15%. Weekly monitoring profiles of total silicon and iron concentrations do not exhibit the same strong peak at Keeler (see Figure 5). These data indicate that coarse sulfur is a good tracer of the aerosols suspended from the lake bed. Fine sulfur aerosols do not follow the same trend as coarse aerosols and are probably due to gas-to-particle conversion processes in the valley and long range aerosol transport into the valley. The weekly monitoring profile of fine aerosol mass also indicates that fine particles are not generally produced by suspension of lake bed aerosols. The dust storm profiles, however, do indicate that an increase in fine aerosol mass occurs near the lake bed, suggesting that during dust storms, the dry lake is a significant contributor to the fine atmospheric aerosol concentrations. This may be due to the high winds which occur during dust storms. During these high wind periods, saltation and creep of intermediate particles may be increased significantly (9). This action would aid in the suspension of fine particles from the surface of the dry lake. Hence, increased fine particle concentrations near the lake bed would be measured.

As an indication of the effect of dust storm episodes on the aerosol concentration in the valley, the per cent increase in the weekly total mass, coarse sulfur, chlorine, silicon, and iron concentration during a dust storm was computed. In addition, the absolute increase in these quantities was also computed. The results of this analysis are shown in Table II. These data also indicate that a significant increase in aerosol concentration due to suspended lake bed materials occurs as far downwind as Independence. In order to quantify this effect, the sulfur to iron (S/Fe) and chlorine to iron (Cl/Fe) ratio at each site was examined. At Keeler, all the coarse sulfur and iron measured at the sampling site are suspended from the lake bed. At any site

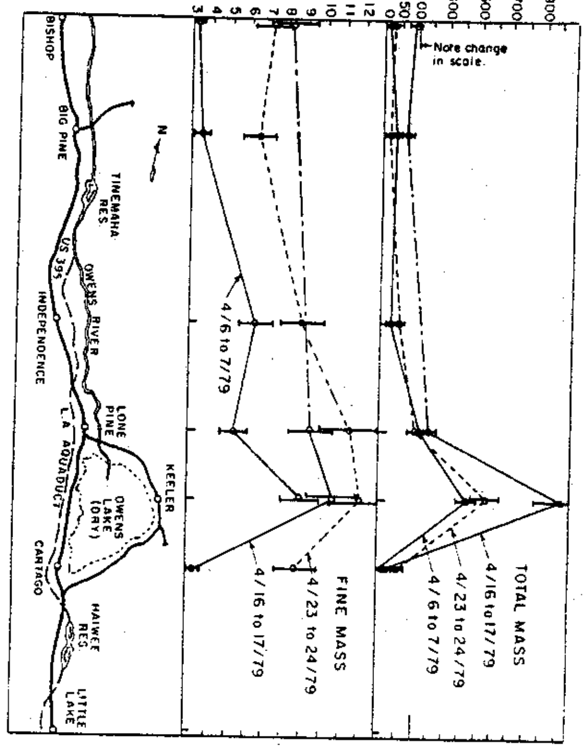


Figure 7. Total mass (particles less than 15 µm) and fine mass (particles less than 2.5 µm) measured during 3 dust storms: April 6–7, April 16–17, and April 23–24, 1979. Error bars are ±15% measurement system error.

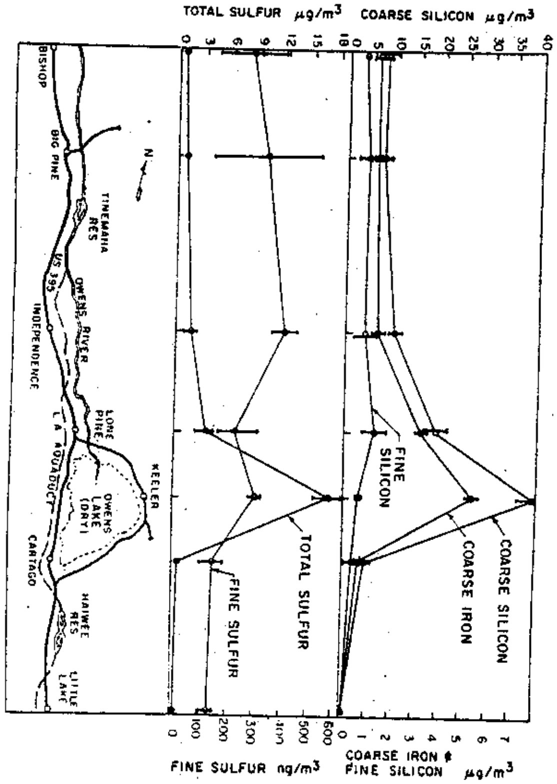


Figure 8. Mean concentrations of coarse and fine Si, coarse Fe, and total and fine S measured during the 3 dust storm periods. Error bars are standard error of the mean.

TABLE II. PER CENT AND MASS INCREASE OF AEROSOLS DURING DUST STORMS

	BISHOP	BIG PINE	INDEPENDENCE	LONE PINE	KEELER	CARTAGO	LITTLE LAKE
			Per Cent Increase				
Total Mass	80 ± 86	45 ± 59	56 ± 22	356 ± 66	1121 ± 384	-14 ± 47	-88 ± 29
Sulfur	3 ± 41	11 ± 57	138 ± 92	631 ± 212	1598 ± 342	137 ± 75	-38 ± 23
Chlorine	87 ± 48	150 ± 135	172 ± 67	1024 ± 442	933 ± 442	367 ± 272	-3 ± 42
Silicon	58 ± 54	27 ± 31	40 ± 29	213 ± 47	556 ± 101	-15 ± 34	-86 ± 34
Iron	61 ± 70	40 ± 48	27 ± 30	186 ± 32	477 ± 72	-23 ± 31	-86 ± 26
			Mass Increase				
Total Mass µg/m^3	22 ± 23	13 ± 17	19 ± 7	137 ± 22	644 ± 186	-5 ± 16	-25 ± 6
Sulfur ng/m^3	11 ± 135	42 ± 216	908 ± 561	3087 ±9115	16111 ±1746	404 ± 209	160 ± 91
Chlorine ng/m^3	61 ± 29	141 ± 120	549 ± 125	2641 ± 973	11414 ±4396	639 ± 430	-7 ±107
Silicon ng/m^3	2977 ±2759	1354 ±1564	2023 ±1455	12806 ±2470	33919 ±2906	-775 ±1704	-3091 ±946
Iron ng/m^3	495 ± 562	343 ± 412	243 ± 271	1810 ± 230	4501 ± 306	-197 ± 262	-652 ±152

downwind from Keeler, all the coarse sulfur and iron measured at the sampling site are suspended from the lake bed. At any site downwind from Keeler, all the coarse sulfur and chlorine is from the lake, but the measured coarse iron and other soil-derived materials are only partly due to lake bed suspended materials. Hence, if we knew the ratio of the coarse iron from the lake to the total iron measured at the site, then we could determine the fraction of the measured aerosol contributed from the lake bed. The following relationship allows us to calculate the ratio of lake bed iron (Fe_L) to total iron measured at a site (Fe_T).

$$\frac{Fe_L}{Fe_T} = \frac{Fe_L/S_L}{Fe_T/S_L} \quad \text{but} \quad \frac{Fe_L}{S_L} = \frac{Fe_K}{S_K} \quad \text{where} \quad \frac{Fe_K}{S_K}$$

is the ratio of iron to sulfur at Keeler. Furthermore, if all the sulfur at the site if from the lake bed, then

$$S_L = S_T$$

at the site and:

$$\frac{Fe_L}{Fe_T} = \frac{Fe_K/S_K}{Fe_T/S_T} = \frac{S_T/Fe_T}{S_K/Fe_K}$$

The same argument can be made for the chlorine to iron ratio. Hence, by calculating the S/Fe and Cl/Fe ratio at each site and normalizing it to the S/Fe and Cl/Fe ratio at Keeler, it is possible to determine the fractional contribution of elemental lake bed materials to the measured aerosol concentration at the site under study. Furthermore, since the ratio of iron to total gravimetric mass (Fe/Mass) is nearly constant across all seven study sites, it is possible to use the normalized S/Fe ratios as a measure of the total mass contributed by the lake bed at each site. Table III shows the S/Fe and Cl/Fe ratios normalized to Keeler. Also included is the Fe/Mass ratio. The two normalized ratios (S/Fe and Cl/Fe) provide a range of values over which the fraction of aerosols produced from the dry lake bed at each site can be determined. Table IV shows the range of contributions from the dry lake bed to the total suspended particulate (TSP) load at each site. The average weekly aerosol TSP value and the normalized S/Fe and Cl/Fe ratio was used to calculate the values in Table IV. These data also indicate that a significant increase in aerosol mass due to materials contributed by the dry lake occurs as far north as Independence.

The use of Cl and S as lake bed tracers, and Fe as a tracer of non-lake bed soils, is given support by analysis of Owens Lake brine (10). This analysis, as well as analyses of several other

TABLE 3. SULFUR AND CHLORINE TO IRON RATIOS

	BISHOP	BIG PINE	INDEPENDENCE	LONE PINE	KEELER	CARTAGO	LITTLE LAKE
(S/Fe) site / (S/Fe) Keeler	.19 ±.06	.24 ±.08	.56 ±.19	.40 ±.11	1.00 ± .27	.18 ±.04	.33 ±.08
(Cl/Fe) site / (Cl/Fe) Keeler	.10 ±.03	.12 ±.04	.31 ±.10	.29 ±.08	1.00 ± .23	.15 ±.03	.29 ±.07
S/Fe	.22 ±.06	.28 ±.08	.65 ±.19	.46 ±.10	1.17 ± .22	.21 ±.03	.38 ±.06
Cl/Fe	.12 ±.03	.14 ±.04	.37 ±.10	.35 ±.08	1.19 ± .19	.18 ±.03	.35 ±.07
Fe/Mass	.030 ±.005	.030 ±.005	.027 ±.006	.025 ±.006	.016 ± .004	.025 ±.008	.027 ±.004

lakes compiled by Eugster (1) are presented in Table V. The total dissolved solids level is given in ppm, while the individual constituents of the brine are normalized to the total. The sulfate and chloride ions comprise 60% of the anions present, suggesting that they are appropriate lake bed tracers. Iron is absent as a brine constituent, indicating that it is present only in the surrounding soils and in the bottom muds of the lake.

TABLE 4. MASS CONTRIBUTION OF THE DRY LAKE BED TO THE AVERAGE WEEKLY T.S.P. VALUE AT EACH SITE (Particles Less Than 15μm

SITE	RANGE
Bishop	2.8 - 5.2
Big Pine	3.4 - 6.9
Independence	10.5 - 18.7
Lone Pine	11.3 - 15.1
Keeler	- -
Cartago	5.2 - 6.2
Little Lake	8.2 - 9.1

Hazardous Materials

A detailed analysis of two possible hazardous materials, sulfur and lead, was made in this study. Figure 6 shows the average weekly spatial profile of sulfur, and Figure 8 shows the sulfur profile during a dust storm. The error bars on Figure 8 represent the standard error of the mean. Both of these figures indicate that a significant enhancement of the coarse (15μm-2.5μm) sulfur mode occurs near the lake bed. The chemical states of the airborne sulfur can be inferred from information on the geochemistry of the alkaline lake bed. The exposed lake bed consists of a saline crust overlying alkaline muds. A powdery deposit often forms on the top of the saline crust when moisture is near the surface through the mechanism of capillary efflorescence. These efflorescent crusts have a composition quite different from the underlying saline crust and mud. They are rich in thenardite (Na_2SO_4), burkeite ($Na_6(SO_4)CO_3$), trona ($Na_3H(CO_3)_2 \cdot 2H_2O$), pirssonite ($Na_2Ca(CO_3)_2 \cdot 2H_2O$), thermonatrite ($Na_2CO_3 \cdot H_2O$), halite (NaCl), and sylvite (KCl). The proportion of sulfur in these minerals is much higher than in the other components of the lake bed, and the chemical form of the sulfur is sulfate. The data on ambient aerosols indicate that these efflorescent crusts are important in the generation of airborne particles. The sodium to sulfur (Na/S) ratio in bulk samples (mud and saline crust and efflorescent crust) of the Owens lake bed, resuspended by air streams in the laboratory, is approximately 33, while the Na/S ratio in ambient aerosols measured at Keeler is 4 ± 1.

TABLE V. ANALYSIS OF BRINES FROM SELECTED SALINE LAKES

Total in ppm, constituents normalized to total

	OWENS LAKE	MONO LAKE	DEEP SPRINGS LAKE	SEARLES LAKE	SALINE VALLEY
SiO_2	1.4×10^{-3}	2.5×10^{-4}	-	-	1.3×10^{-4}
Ca	2.0×10^{-4}	7.9×10^{-5}	9.2×10^{-6}	4.7×10^{-5}	1.0×10^{-3}
Mg	9.8×10^{-5}	6.0×10^{-4}	3.6×10^{-6}	-	2.0×10^{-3}
Na	.38	.38	.33	.33	.36
K	.016	.021	.058	.077	.017
HCO_3	.24	.096	.028	-	2.2×10^{-3}
CO_3		.18	.066	.081	-
SO_4	.10	.13	.17	.14	.081
CL	.25	.24	.36	.36	.53
TOTAL	213,700	56,600	335,000	336,000	282,360

The Owens Lake brine analysis of Table V indicates that the Na/S ratio should be approximately 3.8 for lake bed materials, which agrees quite well with the ambient ratio measured at Keeler. The above data suggests that airborne sulfur aerosols measured in the Owens Valley are in the form of sulfates which are suspended from the efflorescent crust on the Owens Lake bed. Therefore, if we assume that all the sulfur measured at each site is in the form of sulfate, then during a dust storm, the sulfate standard for the state of California (25μg/m^3) is violated near the Owens Lake. It should be noted that the sulfate standard was developed for very fine acidic aerosols. The sulfates measured here are larger and basic particles, so their toxicity may be different from particles for which the standard was written. The calculated sulfate levels at each site during a dust storm are listed in Table VI.

TABLE VI. TOTAL SULFATE CONCENTRATIONS DURING A DUST STORM
Micrograms Per Cubic Meter

Bishop	1.0 ± 0.4
Big Pine	1.3 ± 0.7
Independence	4.7 ± 1.3
Lone Pine	10.7 ± 2.8
Keeler	51.3 ± 5.2
Cartago	2.1 ± 0.6
Little Lake	0.8 ± 0.1

The weekly average and dust storm profiles of lead are shown in Figure 9. The error bars represent the standard error of the mean. Although most lead in the valley is in the fine mode (<2.5μm), some coarse lead is present at a few sites in the valley. The relatively flat lead profile suggests that this material is produced from automobiles driven in the basin. The increased total lead concentration near Keeler during a dust storm suggests that the dry lake bed may be a source of these aerosols. However, the magnitude and spatial extent of the total lead increase during a storm are very small and suggest that lead aerosol suspension from the dry lake bed is not a significant problem.

Mono Lake Monitoring

During the last seven weeks of the Owens Valley study, (April 19 to June 11, 1979), weekly aerosol monitoring was conducted at one site in the Mono Lake area near Lee Vining. Although more study is needed in this area, some preliminary remarks regarding this data can be made. Figure 6 shows the total gravimetric mass concentrations measured during this study period. The most

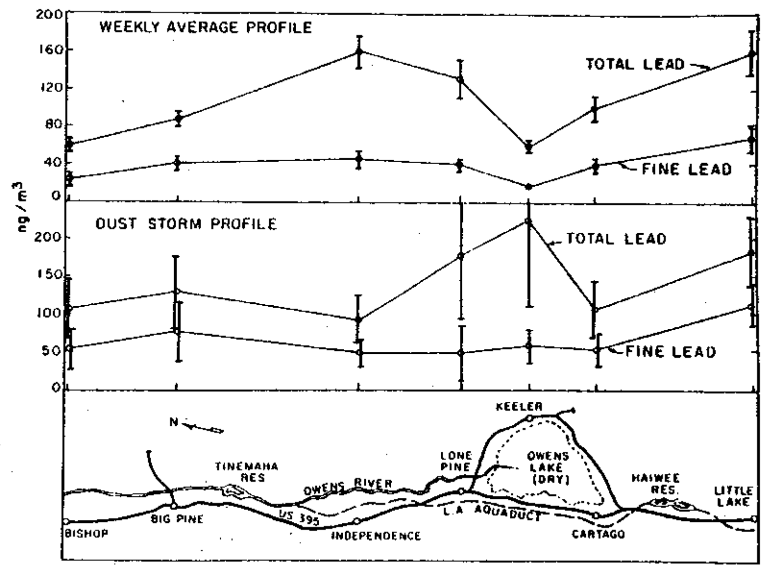


Figure 9. Average weekly concentration at each sampling site of total (particles less than 2.5 μm) Pb.

Error bars are standard error of the mean. Also included are profiles of total and fine Pb for the dust storm of April 13–14, 1979. Error bars are ±15% measurement system error.

obvious trend shown by these data is the increase in TGM from the beginning of the study period to the end. This is probably due to decreased precipitation and the subsequent drying of the soil near the sampling site. We believe that if monitoring had continued, even higher TSP concentrations would have been ovserved during the summer. The peaks of late April and early May correspond to dust storm periods observed in the record for Owens Valley.

The measured sulfur levels during this study period were approximately .3$\mu g/m^3$ or about .9$\mu g/m^3$ of sulfate. Soil samples collected in the Mono Lake area indicated a sulfur to iron ratio of 1.5 - 2.0. At Owens Lake, the sulfur to iron ratio is about 0.24. The data of Table IV indicate that the Mono Lake brine contains a higher proportion of sulfate anion that did Owens Lake. These data all suggest that Mono Lake has a greater potential than the Owens Lake for a sulfur aerosol problem if the Mono Lake bed is allowed to dry out. This hypothesis is supported by studies of alkaline lake bed chemistry which indicate that sulfates are found in the efflorescent crusts in lakes in Inyo County (e.g. Deep Springs Lake), and hence, can be suspended in the atmosphere. In fact, B.F. Jones of the U.S. Geological Survey asserts that at Deep Springs Lake: "although the wind frequently stirs up clouds of salt laden dust from efflorescent crusts on the west side of the playa, the well indurated crusts of the Central Lake area do not contribute much to aeolian transport," (11). Jones also indicated that Deep Springs Lake is the best chemical analog to Mono Lake.

Further study during the summer months is needed to determine if these preliminary data are representative of the typical condition in the area.

Conclusions

The data collected in the Owens Valley during this study suggest the following conclusions. First, dust storms occur frequently, and their effect on air quality in the valley is significant. This was shown by the elevated TSP values measured during the study and the frequent reports by station operators of blowing dust. The dry lake bed was found to be an important contributor to the TSP concentrations measured downwind. The contribution of lake bed aerosols to the TSP concentration at sites as far downwind as Independence was significant. Furthermore, aerosols suspended from the lake bed included significant concentrations of sulfur. Violations of sulfate standards near the lake bed often occur during dust storms. Preliminary data collected in the Mono Lake area indicate that the dry lake bed areas near Lee Vining may contribute substantial aerosol mass to the measured TSP levels. Furthermore, the potential for sulfate standards violations due to lake bed suspended aerosols at Mono Lake may be greater than the observed violations in the Owens Valley,

since the sulfur to iron ratio is an order of magnitude greater for Mono Lake bed soil samples than for Owens Lake bed soils. Further study is needed in the Mono Lake area in order to determine the magnitude and extent of the aerosols suspended from the lake bed.

Literature Cited

1. Eugster, H.P. and Hardie, L.A. "Saline Lakes" chapter 8 of Lakes: Chemistry, Geology, Physics, Abraham Lerman ed., Springer-Verlag, New York, 1978.

2. Reinking, R.F., Mathews, L.A., and St. Amand, P. "Dust Storms Due to Dessication of Owens Lake," International Conference on Environmental Sensing and Assessment, Las Vegas, Nevada September 14-15, 1975, IEEE publishers 1976.

3. Slinn, "Dry Deposition and Suspension of Aerosol Particles - A New Look at Some Old Problems" ERDA Symposium, 1976, 38, 1.

4. Cahill, T.A., Ashbaugh, L.L., Barone, J.B., Eldred, R.A., Feeney, P.J., Flocchini, R.G., Goodart, C., Shadoan, D.J., and Wolfe, G. "Analysis of Respirable Fractions in Atmospheric Particulates via Sequential Filtration" APCA Journal 1977, 27(7) 675.

5. Whitby, R.T., Husar, R.B., Liu, B.Y.U. "The Aerosol Size Distribution of Los Angeles Smog" J. Colloid. Interface Sci., 1972, 39, 211.

6. ICRP Task Group on Lung Dynamics, "Deposition and Retention Models for Internal Dosimetry of the Human Respiratory Tract" Health Physics, 1966, 12, 173.

7. Cahill, T.A., Eldred, R.A., Barone, J.B., Ashbaugh, L.L., "Ambient Aerosol Sampling with Stacked Filter Units" FHWA Report 1978, FHWA-RD-78-178.

8. Cahill, T.A., Flocchini, R.G., Feeney, P.J., Lang, S., Shadoan, D.J., Wolfe, G. "Monitoring Smog Aerosols with Elemental Analysis by Accelerator Beams" Nat. Bur. Stand. 1976, Special Pub. 422, 1119.

9. Bagnold, R.A. "The Physics of Blown Sand and Desert Dunes" Methuen, London, 1941.

10. Clark, F.W. "The data of Geochemistry" U.S.G.S. Bull., 1924, 770, 156.

11. Jones, B.F. U.S.G.S. Prof. Paper 502-A, 1965.

RECEIVED March 10, 1981.